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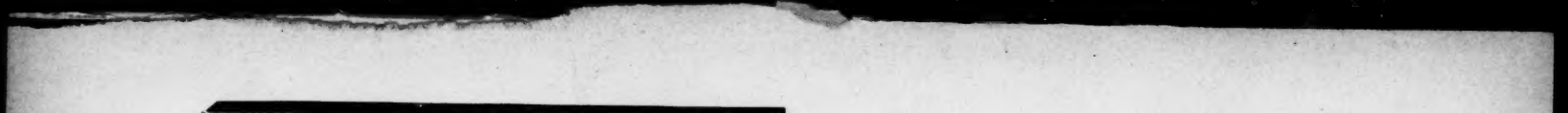

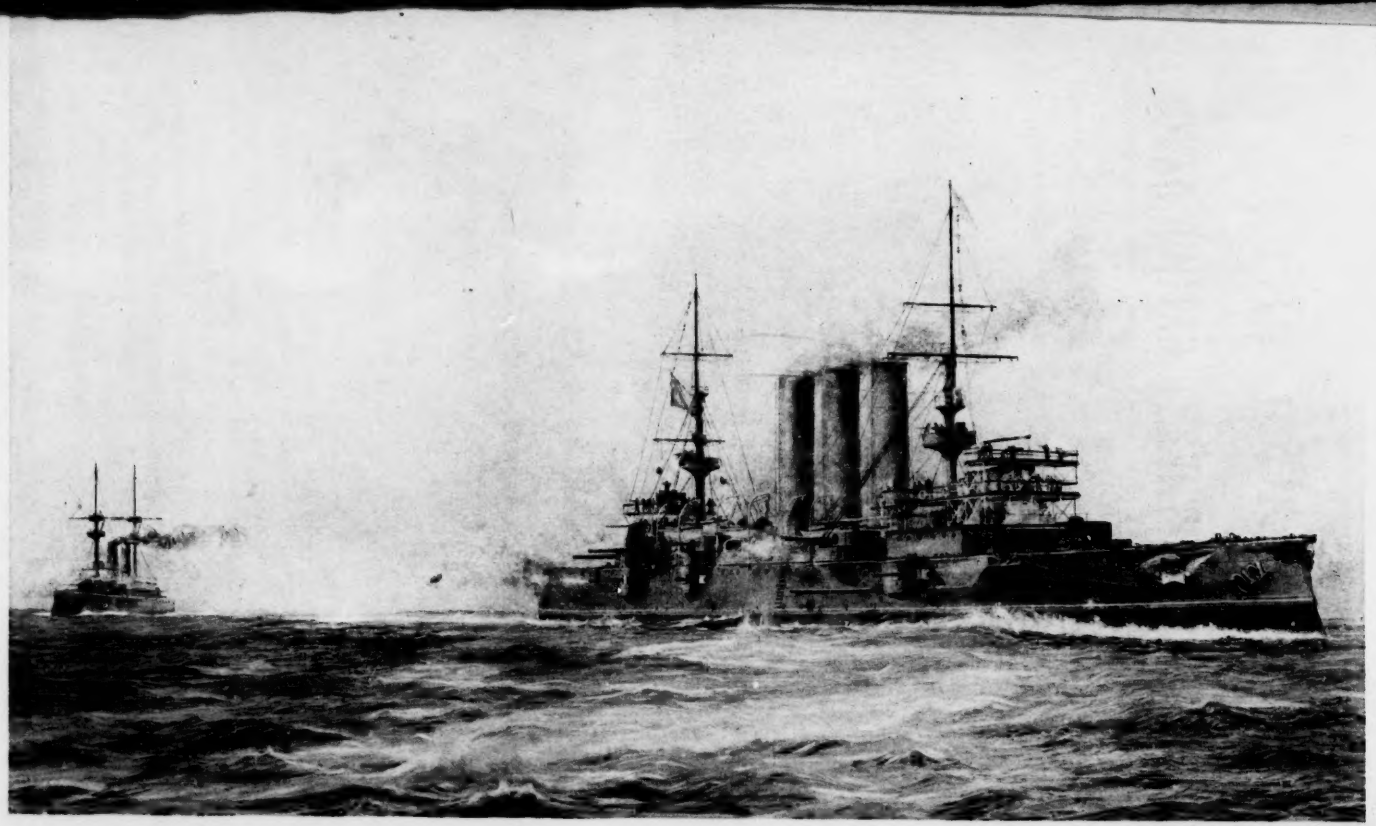

J. J. K. & Co.] CHILIAN FIRST-CLASS ARMOURED CRUISER "GENERAL O'HIGGINS," 8,500 TONS, 16,000 I.H.P., SPEED 21·8. [London.

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Armour Protection—7-inch water-line belt, 6-inch on gun positions, and 2-inch armour deck.

ERRATA IN *October* JOURNAL.

Page 1146, lines 15, 18, 20, 37, for "*Bullet*" read "*Bolt.*"

A Lecture will be delivered in the Institution on Thursday, the 8th December, at 3 p.m., on

"The present situation on the Indian Frontier,"

by the

Rt. Hn. Sir Richard Temple, Bt., G.C.S.I., C.I.E., D.C.L., LL.D.

The Chair will be taken by Lieut.-General Lord Methuen, K.C.V.O., &c., Chairman of the Council.

Members wishing to invite friends are requested to inform the Secretary.

THE JOURNAL
OF THE
ROYAL UNITED SERVICE INSTITUTION.

VOL. XLII. NOVEMBER, 1898. No. 249.

[*Authors alone are responsible for the contents of their respective Papers.*]

WIRELESS TELEGRAPHY.

By Captain J. N. C. KENNEDY, R.E. (2nd Division Telegraph Battalion), Superintending Engineer, Postal Telegraphs.

Wednesday, March 30th, 1898.

General Sir RICHARD HARRISON, K.C.B., C.M.G., R.E., Quarter-Master-General to the Forces, in the Chair.

DURING the last year so much has been said and written about "Wireless Telegraphy" that it will only be necessary for me to deal briefly with the history of its development. To those who are much interested in this subject I would strongly recommend the perusal of Captain Brett's lecture published in the current number of the Proceedings of the R.A. Institution. The value of the article is enhanced by the very practical remarks of Mr. Gavey, the Assistant Engineer-in-Chief of the G.P.O.

Communication can be maintained telegraphically between two or more stations without the aid of a direct wire in two ways:—1. By Mr. Preece's Post Office system. 2. By Mr. Marconi's method. I shall describe both systems, but as the latter appears to offer greater possibilities from a Service point of view it will to-day engage our more serious attention.

In 1864 Professor Clerk-Maxwell, of Cambridge, enunciated what is known as the electro-magnetic wave theory of light, or, in other words, that light and electricity were identical. Both phenomena are caused by vibrations in that imponderable fluid which pervades all space—ether. This is one of the greatest discoveries of the Victorian era. This theory was afterwards proved, beyond a doubt, by Heinrich Hertz, who, in 1880, in the course of his investigation of the spectrum discovered some electric waves, which now bear his name.

In the spectrum, the positions occupied by the different kinds of rays can be located. The visible portion including the various colours is well

known. The heat rays stand at the red end, while the actinic or photographic rays are at the violet end. The electric rays are situated in the ultra-red, and the Roentgen rays are beyond the violet.

In order to produce his waves, Hertz used the electrical discharge, the actual apparatus being a Leyden jar, and to discover their presence he employed his so-called "Resonator," which is a metal ring with a small gap in it. The instrument will detect the presence of electric waves, for if it is put in the path of an electric wave a small flash of lightning will take place between the two poles. This resonator is aptly termed by Professor Lodge the "Electric Eye." Just as the waves of light are visible to the human eye, so the Hertzian can be detected by the "Electric Eye."

Professor Silvanus Thompson has designed an apparatus to illustrate ethereal wave action. At one end is the transmitter, a heavy weight to which a blow is given causing it to vibrate a certain number of times per minute. At the other end is fixed a receiver, timed to oscillate in the same period. Connecting the two is a row of balls, suspended so that each ball can impart a portion of its energy to the next in the series. Although each ball vibrates at right angles to the line of propagation of the wave, still the impulse is transmitted along the entire row.

By this means we have a visible illustration of that which is absolutely invisible. The wave you see differs from a wave of light or of electricity only in its length and in its frequency. Electro-magnetic waves vary from units per second to millions. Light waves vary between 800 and 400 billions per second, and electric waves differ from them in no other respect. Both kinds of wave travel with the same velocity, viz., 186,400 miles per second.

The following will give an idea of the magnitude of these figures: If a tuning fork makes 1,000 vibrations per second, it will require 12,000 years to perform 400 billion oscillations, which are accomplished in one second by the red light. Turning again to the wave model, let us suppose the metal ring to be fixed, and then consider what would happen. The wave, on reaching the receiver, would be reflected back along the row of balls and effect their movement. This is exactly what Hertz did when investigating the electric waves. He directed the invisible rays arising from a spark discharge against a metal plate, whence they were repelled. By inserting his resonator at different distances in the path of the rays, he could fix the points where it best responded and such places where it was entirely unaffected. Thus he was able to ascertain the length of wave, and by multiplying the length of wave by the number of oscillations per second he obtained the velocity of the ray. This coincided exactly with that of light.

Hertz's resonator was a very defective eye; it was weak and short-sighted. Mr. Edouard Branley, in 1880, devised a sensitive tube, which was afterwards improved upon by Lodge and brought to perfection by Marconi. Professor Oliver Lodge went very deeply into the problem of electric waves, and he succeeded in obtaining "effects" up to 40 yards.

These are his words in 1894 :—"I mention 40 yards, because this was one of the first outdoor experiments, but I think that something more like half-a-mile was nearer the limit of sensibility. However, this is a rash statement not at present verified."—(*Work of Hertz*). The following is taken from Trowbridge's book, "What is Electricity?" 1897, page 256 :—"Unfortunately, we cannot detect the electro-magnetic waves more than 100 feet from their source."

Last year Mr. Marconi came on the scene, and succeeded in sending good readable messages over a distance of 18 miles, and in getting effects at nearly 40 miles instead of 40 yards. This achievement was partly owing to the assistance originally rendered him by Mr. Preece, but chiefly due to his own ability and exertions. Notwithstanding this, there are still some who maintain that Marconi has discovered nothing new. The following criticism by Professor Silvanus Thompson is a sample :—

"Then," continued Professor Thompson, "the British Post Office took the matter up, and adopted the coherer or receiver of an Italian—Marconi." "Marconi," continued Professor Thompson critically, "has done nothing new. The British Post Office, instead of making use of the ideas of Hertz, nine years ago, or of Professor Lodge's four years ago, have really only obtained through Marconi a slight development of Professor Lodge's receiver." Professor Thompson concluded by stating that in Berlin Professor Slaby, by a simple and slight development of the ideas put forward by Lodge and Tesla, and claiming no novelty for his invention, had succeeded in telegraphing through space for 13 miles, whereas the only result of Marconi's coherer, as at present made known, had been to enable telegraphic messages to be recorded without intervening wires over a distance of 11 miles.—*Daily Graphic* (December).

In the first place, the P. O. had a system in practical use by which Mr. Preece had signalled several miles across space. How could Mr. Preece be expected to take up Professor Lodge's system, which, according to his own showing, had a possible range of but half-a-mile? Professor Slaby after attending experiments in England returned to Germany, and with the valuable assistance of the Balloon Corps attained a distance of 13 miles, using Marconi's apparatus. Professor Slaby, in his official report, which I have by me, ascribes the success which attended his efforts entirely to the information he obtained from Marconi during his visit to England.

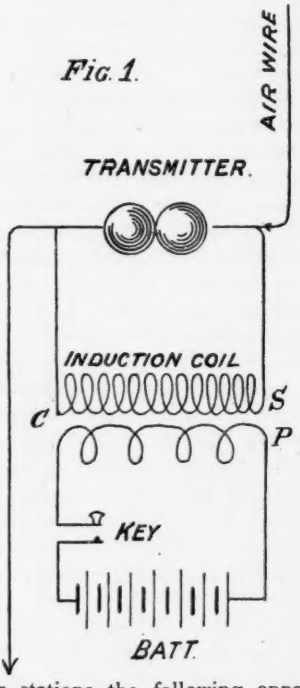
In describing Marconi's apparatus I shall only deal with its most important points :—

At one station is fixed the transmitter or sending instrument, consisting of a row of two or more metal balls, one end of which is attached to a vertical wire, while the other end is connected to the ground. (Fig 1.) The vertical wire can be suspended in various ways, by a pole, a balloon, a kite, a church steeple, or anything else that happens to be in the way.

By a suitable machine sparks are made to pass across the spaces between the balls, which charge and discharge the vertical with great

rapidity. While the sparks pass, Hertzian waves are given off from the wire. In the figure, C is an induction coil of which P and S represent the primary and secondary windings respectively.

Fig. 1.



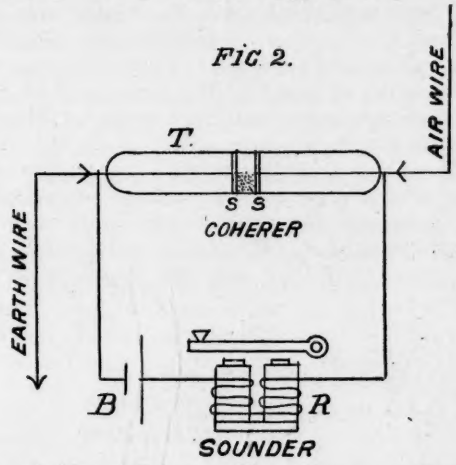
At the receiving stations the following apparatus is fixed:—A Branley sensitive tube T or "coherer" in circuit with a battery B and a telegraphic instrument R. In the middle of the glass tube are two silver plates S, S, about $\frac{1}{16}$ inch apart. This space is half filled with metallic filings. The interior of the tube is a vacuum, and connection is made from the silver plates to the outside by platinum wires fused through the glass. One end of the tube is attached to a vertical wire similar to that erected at the sending station; the other end is generally put to earth. (Fig. 2.)

The action is as follows:—The tube in its normal state is practically a non-conductor, and consequently no current circulates in the circuit. When, however, the Hertzian waves impinge on the vertical wire the tube undergoes a change, and becomes a good conductor. A current flows from the battery causing the telegraph instrument to act, and a signal is recorded.

The chief difference between the arrangement you see before you and that devised by Professor Lodge lies in the vertical wire, but it means the difference between miles and yards. There are many other devices the young inventor has added, all of which are essential for

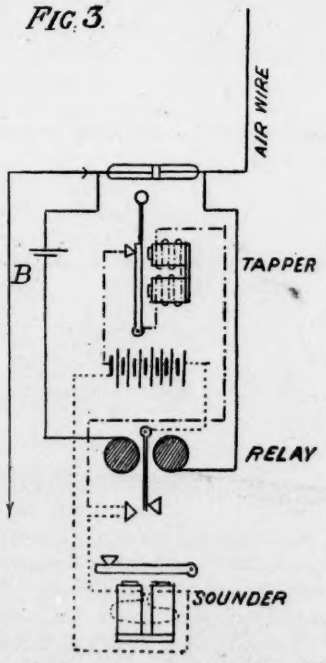
practical working—among them the tapper, compensated relay and

FIG. 2.



inker, shunts, choking coils, etc. Time, however, will not admit my describing them now. In short, Marconi has converted a laboratory

FIG. 3.



experiment into a practical system of telegraphy. Fig. 3 gives detailed

connectus of receiver. I will now show you the apparatus working.

[Messages were transmitted across the theatre, from one vertical wire to the other.]

There is a wall, about 10 feet thick, between the museum and this theatre. A transmitter is placed in the former, and here we have a receiver. I will ask someone to write out a message and have it taken to the transmitter, so that there will be no misconception. If all is well, there should be no mistake in the message, but errors in telegrams are not altogether unknown even in such a perfect service as the British Post Office. [A message was written out by an officer present and a duplicate handed to another. It was then sent through the wall and read out as follows:—"Will you dine with me this evening and go to

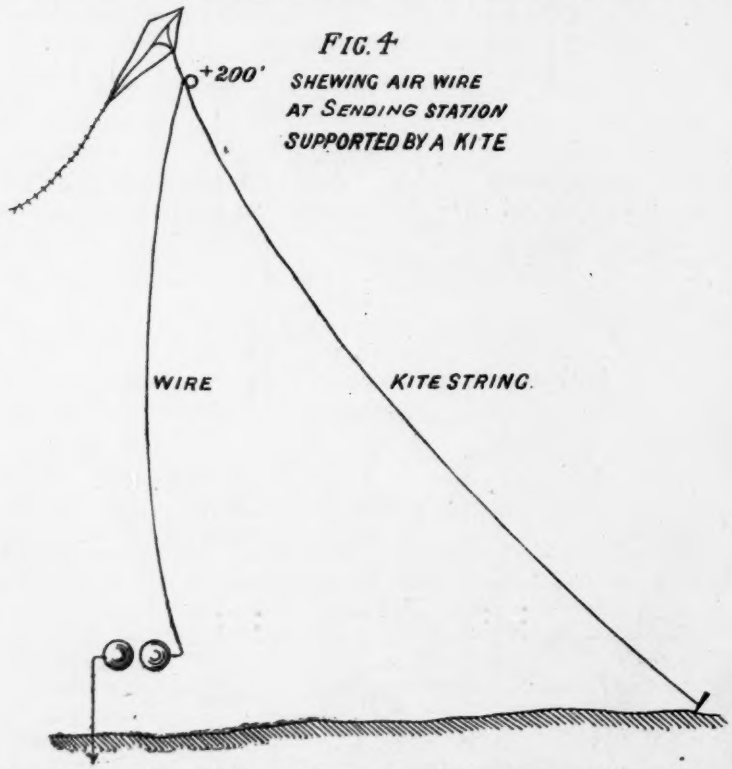


FIG. 4
SHEWING AIR WIRE AT SENDING STATION SUPPORTED BY A KITE

the 'Circus Girl,'" which proved correct. The message, unfortunately, was not addressed, and the sender firmly declined to say for whom it was intended; the kind invitation therefore went begging.]

The first serious experiments were commenced by the Post Office across the Bristol Channel just a year ago, between Lavernock and Breandown. The distance was 5,000 metres, and the height of the wire

34 metres, poles being used to keep the wires up. Successful communication was effected over a distance of nearly 9 miles. The means adopted for supporting the vertical wire on that occasion is shown in Fig. 4.

Unfortunately for science, last summer a company was formed, and progress was temporarily interrupted by financial interests, and the Post Office was compelled to sever its connection with Mr. Marconi. Nevertheless, experiments were continued in various places — at Woolwich by Captain Brett, R.E., and at Devonport by Captain Jackson, R.N., as well as by Mr. Marconi. It will be a satisfaction for Captain Jackson to learn that the form of transmitter designed and used by him is now being employed with success for long distance at the Isle of Wight.

At the latter place a wire was erected on board a tug and another suspended from a pole at Alum Bay. The tug cruised about until it reached Swanage, 18 miles, and got good signals all the way. There was no reason why the experiment should have stopped then, but the captain would not proceed further owing to the bad weather. There were four operators on board, but only one of them was able to stay anywhere near the instrument.

[Some of the signals then recorded on the trip were exhibited.]

Without detracting from the honour due to Marconi, for his brilliant discovery, it is only fair to point out that Captain Jackson had been engaged on wireless telegraphy before the former's arrival in England. Indeed, it is difficult to say which of these inventors was the first to discover the virtue attached to the use of the vertical wire.[1] Marconi, however, was first at the Patent Office.

They are now very good friends.

As previously mentioned, Professor Slaby made a most exhaustive series of experiments, and at Spezia the Italian naval authorities have been most successful.

The following table gives the comparative values of the results of some of the experiments[2]:—

Place.	Distance.	Height of Wire.	Approx. Value.	Special Circumstances.
	m.	m.		
Cardiff - - -	5,000	34	150	Sea.
,, - - -	14,000	60	200	,,
Spezia - - -	7,000	34	200	Sea and land.
Sacrow - - -	1,600	26	70	Land.
Pfanen - - -	3,100	65	50	Woodland.
Rangsdorf - -	21,000	300	70	Land.
Isle of Wight -	29,000	27	1,000	Sea.

[1] This is an error. Captain Jackson has disclaimed any priority in the use of a vertical wire, and has frankly stated he received the suggestion from Mr. Marconi.—J. N. C. K.

[2] To this list may now be added the experiments at the late Kingston Regatta, when the progress of the races were telegraphed to the shore for publication. On this occasion messages were sent up to a distance of 25 miles.—J. N. C. K.

There is a marked difference in the distance obtained between the land experiments and those carried out over water. Professor Slaby attributes this to the probability of the sea air being clearer than the atmosphere on shore. English experience, however, leads to other conclusions. There appears no reason why the difficulty of signalling on land cannot be overcome.

The results of the various experiments of 1897 have led to a very considerable simplification of the apparatus.

At Cardiff, an 18-inch induction coil, excited by cumbrous accumulators, an oil bath, and 200 feet of wire were employed; while to-day, at the Isle of Wight, excellent effects are being obtained with a 6-inch coil without the oil, worked by a portable dry battery, and a vertical wire of less than 100 feet.[1]

The practical application of the system, from a commercial or financial stand-point, can have but little interest to the present audience. It might be mentioned, however, that its greatest sphere of usefulness will be at sea. At present there is no satisfactory way for connecting many of our light-ships and light-houses with the shore. Cables have been tried without success—we must look to some wireless system.

If light-houses were equipped with a simple arrangement, electric as well as light flashes could be emitted to guide ships in thick and foggy weather.

Ships properly fitted would have no difficulty in making the land in any weather.

At important ports an incoming ship would be enabled to herald its approach, so that everything could be got ready to receive the cargo and passengers.

Outward-bound ships could receive the very latest news, such as the results of races, football matches, or other items of interest.

As applied to the Services:—

In time of war, information could be sent to port from great distances by placing intermediate ships as relay stations.

Passing cruisers could communicate with the shore without coming within visual range by day or night.[2]

A friendly craft entering a fortified harbour at night could make known its identity and so escape immediate destruction.

Orders might be communicated between the various ships of a squadron, when, owing to atmospheric conditions ordinary means failed.

[1] An interesting account of Mr. Marconi's operations at the Isle of Wight is contained in the *Times* of 20th April.

[2] During the recent indisposition of the Prince of Wales on board the "Osborne" at Cowes, the system was put to practical use. Mr. Marconi, as the guest of His Royal Highness, maintained constant communication with the Castle for the fortnight the ship remained in the Solent.

Considerable apprehension was aroused when Mr. Marconi brought his ethereal waves on board the yacht, and the commander had all the explosives promptly removed from the magazine in the vicinity of the infernal machine. No catastrophe occurred after all, the theory that Hertzian waves would explode magazines was itself exploded.—J. N. C. K.

For instance, during a blockade, if the enemy happened to be within electric range conversation would be carried on by cipher.

The system would appear to be invaluable to a fleet manœuvring under cover of darkness, as, for example, approaching an enemy's port at night.

A field appears open in connection with manœuvres with torpedo-boats. Captain Jackson has designed and used a very compact and portable form of apparatus suitable for boat work.

With a slight effort one can imagine a small torpedo-boat going forth to attack a blockading fleet, driving before it a flotilla of torpedoes controlled by this system of electric waves. Before this can be done there are a few details to be worked out. Possibilities like these are awful to contemplate.

Wireless telegraphy has been adopted in the Italian Navy, all the larger ships have already been fitted with the apparatus as well as many smaller craft.

The appreciation in which Mr. Marconi is held by his own countrymen is tangibly expressed in the following extract from a letter to him from the Italian Minister of Marine :—

" His Majesty has been pleased to nominate you an officer of the Equestrian Order of the Crown of Italy, in order to attest the value in which is held the invention that through your exertions has come to enrich the progress of electrical science, and in order also to demonstrate to you the high appreciation of the Royal Navy for what you have done for them."

In applying this system of telegraphy on shore, several difficulties have to be overcome. Ships have facilities for supporting the vertical wire from their masts as well as abundance of electrical energy always at hand which do not exist on shore. Possibly a tower, church steeple, or field observatory may be available to get us over the first difficulty, but in the large majority of cases other means will have to be adopted for sustaining the vertical wire. In Germany balloons were used, and in this country we tried Baden-Powell's kites with great success. I have here one of the kites that were used.

At the Salisbury Plain experiments the transmitting station was fixed, while the receiving apparatus was packed in a small cart. The cart was moved about to various distances and brought into action. The average time taken to set up the kite and receiver, from our arrival on the ground till the first signal was received, was only three minutes.

A long-distance experiment was afterwards tried—from Salisbury to Bath, about 35 miles. Kites were raised at each place to a height of about one mile. Unfortunately the wind blew half a gale, and frequently our wire carried away. Nevertheless, signals were received at Bath, but unreadable. Circumstances prevented the experiment being repeated. We had no kites or wire left. Of the five kites used that day, only one remained up for any length of time. It required a pair of horses and six men to bring that one down. There is no doubt whatever about the lifting properties of Captain Baden-Powell's kites. One runaway kite travelled for seven miles and committed many depredations in

the way of frightening horses, and damaging people who caught hold of its wire. It is hoped that on some future occasion this experiment will be repeated under better conditions.

It is not foreseen that the use of this system by an army will at all affect the existing field telegraphs, but it would form a valuable auxiliary to the visual signalling arrangements. The efficiency of the heliograph, lamp and flag depends entirely on the weather. Marconi's system works a shade better in rainy weather than in fine, and is absolutely unaffected by atmospheric conditions. It would seem that communication could thus be maintained between the General's staff and even the fighting line.

There is another difficulty—the supply of electrical energy in the field. I think this has been solved by the invention of an improved form of dry battery. Its excellence will be understood when I tell you that it has replaced such "Constant" batteries as the "Bi-cromate" and the "Daniells," both in the Post Office, and many of the ocean cable companies. One of these batteries has been in constant daily use, exciting an induction coil, at the Isle of Wight for the last three months without appreciable loss of E.M.F. However, the question of portability does not arise when we consider the application to the defence. In all places where the search-light is used, accumulators can be easily charged.

If reflectors were feasible they would be most convenient. So far experiments in this direction have not been successful, save for short distances. I venture to suggest that trials should be made with the reflector placed "about the vertical wire." The length of wire might be reduced from 100 feet to probably 15 or 20 feet, for distances up to, say, six miles. It is evident to all that with the present arrangement there is an enormous loss of energy. The use of reflectors for directing the signals ensure almost absolute secrecy. The form of reflector suggested above might possibly be built into one of the walls of the fort.

It has been stated that secrecy can be ensured by "tuning." By that I mean that one station might be so arranged that it would respond to the signals sent from another station, only when the two stations are in tune—when the vertical wire at each place is of the same length. Experiments, so far, only show that the best effects are obtained when the instruments are in tune with each other. Professor Lodge, it is understood, is now devoting his energies in this direction. There is, however, reason to believe that this effect may be usefully developed. The wave model shows this to some extent.

This telegraphy in warfare would at once be made difficult if a hostile ray apparatus effected a continuous disturbance of the signals, which would produce an interesting battle of the ethereal waves. This would only be the case when the hostile forces were in actual touch. It is unlikely that any force we are likely to come in contact with will be equipped with wireless telegraphs. If they are, and we are not, we shall be at a decided disadvantage.

The system would probably be most useful to our own Army as a means of maintaining communication between columns advancing on parallel routes, the intervening ground being impassable. In the late

Indian Frontier War it would have been invaluable. A different story might be told of General Jeffrey's Brigade had he been provided with the system.

Circumstances sometimes occur where it is desired to destroy bridges, etc., at a critical moment, the works having previously been prepared for demolition. An electric wave would explode all the charges simultaneously.

A charge of dynamite may be dropped from a kite on an enemy's camp with a modified arrangement of the apparatus.

Sensational articles some time ago appeared in several papers stating that by means of the electric ray it would be possible to explode the magazines of ships. This can easily be done, but it would first be necessary to induce the enemy to place this rather elaborate apparatus in his magazine.

[Here a small charge was exploded by means of a wave sent across the theatre.]

I do not want you to confuse the system I have described with Mr. Preece's well-known method of wireless telegraphy, which has been successfully used by the Post Office for many years.

In dealing with this system, I cannot do better than to describe the arrangements that exist at a place where it is now practically installed, viz., between Lavernock and Flatholme.

These two places had been joined by a submarine cable, which was continually being broken by the anchors of vessels, the tides, etc.

It was at length decided to connect the stations by means of the magnetic system. An insulated wire about three-quarters of a mile long was laid out along the cliffs at Lavernock facing the channel earthed at either end. A similar wire was placed across the Island of Flatholme parallel to that on the mainland. For communicating in one direction the following apparatus was employed:—

At the sending station an instrument V was fixed in the line L working on the principle of an ordinary electric house-bell, which when the key K was pressed caused an interrupted current to flow through the circuit. This action induced similar currents in the parallel circuit at the other station. There a telephone receiver T was inserted in the circuit, which detected the disturbance. Anyone listening at the telephone would hear a continuous buzzing sound.[1]

[1] Until recently some inconvenience was experienced in obtaining the attention of the operator at the far station, if he happened to be any distance away from his instrument. The small induced currents, though clearly audible in the telephone, were not sufficient to excite the coils of a telegraph instrument. The difficulty has now been overcome by the introduction of a "relay," the invention of Mr. Evershed, working on the principle of a coil timed to vibrate in a given period between the poles of a powerful magnet. The minute currents of the same periodicity, passing through the coil gradually develop upon it a cumulative effect which in a few seconds becomes sufficiently strong to close a local circuit and ring a bell. The working of this instrument has been most satisfactory. At the late meeting of the British Association in Bristol, Professor Lodge described a "relay," which he has designed for a like purpose. Its action is very similar to Mr. Evershed's in principle. Mr. Preece, following after, very kindly invited the inventor to come and try his instrument with the circuits on the Bristol Channel, and offered to place the installation there at his disposal.

By means of telegraphic key *K* the operator at the sending station was able to break up this continuous musical note into the dots and dashes of the Morse code. Figs. 5 and 6 show the simple principle diagramatically. The line *L* is put to earth at its extremities, *A* and *B* at each station.

POST OFFICE SYSTEM.

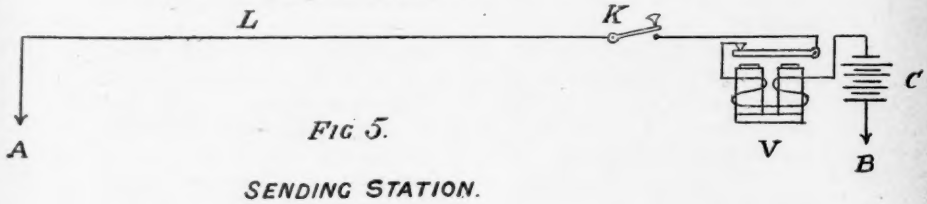


FIG 5.

SENDING STATION.

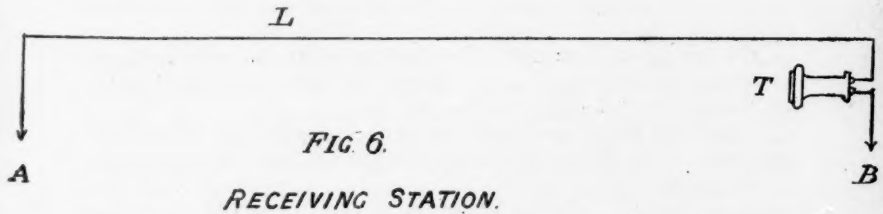
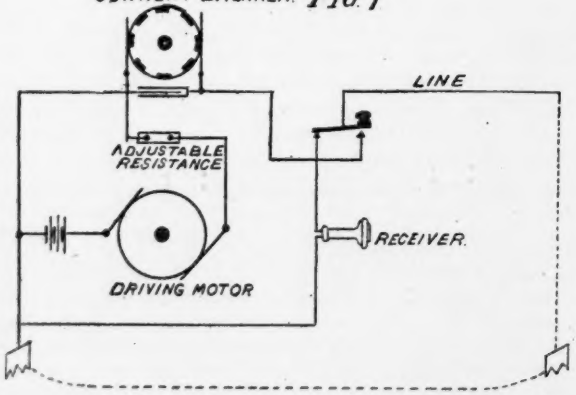


FIG 6.

RECEIVING STATION.

The above apparatus was duplicated at each place to enable conversation to be carried on in both directions. The complete circuit at each station is shown in Fig. 7.

CURRENT BREAKER. FIG 7



During the first experiments an unforeseen difficulty arose. The line was frequently broken by the cattle on the downs. The cows cut and ate the copper wire in many places, gutta-percha covering and all.

The wire was eventually placed on poles, insulated in the ordinary way, and the animals were thus deprived of the delicacy.

I will now show you the system working. It would be inconvenient to stretch long lengths of parallel wire about this theatre, but if the wires are done up in two coils and placed respectively in two parallel planes, it will answer the purpose. To one coil is attached the interrupting arrangement and key, while the other one has the telephone in its circuit.

[The apparatus was shown, and the vibrations were distinctly heard.]

The Morse characters transmitted by the operator to the sending coil can be easily read in the telephone by anyone present who is acquainted with the telegraphic code, the only connection between the two coils being the ether.

The installation at Lavernock must be particularly interesting to the present audience, as it forms a link of the military communications across the Severn, which the G.P.O. maintains for our use.

The difficulty in maintaining communication by cable is not fully understood by the public, especially in situations such as the entrance to the Thames and Medway. At Plymouth during the last three years the cables have been broken nine times, one particular cable being severed four times in three months. Some faults may be repaired in a day or so, the majority require longer than that.

Such is our peace experience—what it will be in war is an uncomfortable speculation.

Mr. MARCONI:—Mr. Chairman, ladies, and gentlemen, it has given me great pleasure to listen to such an interesting lecture as Captain Kennedy has just delivered, and I think that pleasure is shared by us all. I have also great pleasure in thanking Captain Kennedy for the kindly reference he has made to my work. However, I must make mention of the very important and valuable assistance he has rendered me during the experiments we have lately carried out in England. His assistance was of very great benefit, especially during the trial in which kites were used, and I consider that much of the success obtained was due to him. I very often fear that his great zeal in kite experiments will one day cause him to be carried away into the air or clouds by some fugitive kite. As my system is now under consideration, I would prefer not taking part in the discussion that is to follow.

Captain W. P. BRETT, R.E.:— I think the lecturer has been rather too flattering as regards my own work in connection with wireless telegraphy. I have not had anything like the same practical experience as himself, although I have made a study of the subject. If anyone is going to start experimenting with it, he will see at once how easy it is to get a *signal* with almost any apparatus, but will find very great difficulty in getting a *message*. You can set to work and construct a Marconi apparatus, and get signals over, say, a mile or half-a-mile, but you will not be able to interpret them. The dots will become dashes, and the dashes split themselves up into dots, and at first you will not be able to get a single intelligible message. Then you will understand what the difficulty is. When you hear people say they have a system that will transmit a message over 20 miles or so, the first thing is to ask for a transcript of such a message. You will see several messages on the front of the desk there, actual messages sent; and the very practical test that Captain Kennedy put these instruments to by sending actual messages, will show how Mr. Marconi has overcome that great

difficulty—in fact he can send an *intelligible message* as well as *signals*. The lecturer has also alluded to the question of cables. Personally I sympathise very much with the individual who has to maintain electric cables across the mouth of a river. It is a heart-breaking sort of work, when they are renewed one day and destroyed the next by a barge picking it up and cutting it. It has been said that Mr. Marconi deserves credit for *slightly* improving the coherer. I have tried experiments with all sorts of coherers, and Mr. Marconi's is the only one that will give an intelligible message at all. So that I think if you alter the word "slightly" to "enormously" improving the coherer, you will have about a correct appreciation of his work. There is such a number of details to be worked out before success is obtained, that the difficulties in the way are hardly appreciated till one commences to experiment oneself.

Mr. W. H. PREECE, C.B., F.R.S. (Engineer-in-Chief and Electrician to the Post Office):—I have listened with a great deal of interest to this lecture. It is a subject on which I have myself worked so much and spoken so often that it is quite a recreation and enjoyment to hear somebody else descant on the subject. Captain Kennedy has referred to nearly all the work that I have done, and some of the diagrams illustrate admirably the practical result of that work, for, after all, though the Post Office, as he said, sometimes makes mistakes, it never makes the mistake of taking up any matter without feeling almost certain that it must sooner or later lead to some practical result. It has been the conviction that this system of transmitting signals through space will ultimately lead to something very practical indeed, which has led us for fourteen years to work at it regularly and to spend a good deal of money upon it. Captain Kennedy has referred to the system that I introduced and compared it with Mr. Marconi's. He has pointed out, what is perfectly true, that the two systems are based on different principles and work in different directions; but the main principle is this, that while I have been working with horizontal wires, Mr. Marconi has introduced vertical wires. It is not quite exact to say that this system is a system of wireless telegraphy. We both use wires, only Marconi has this advantage over me, that he uses very short wires. With the horizontal wires, in order to communicate across such a sound or channel, say, as the Sound of Mull, which is about two to three miles wide, you must have on each side a length of wire equal to the breadth of the channel to be crossed. For instance, supposing you wanted to communicate between Dover and Calais, the distance across is about 20 miles, and if you have 20 miles of wire on the English coast parallel to 20 miles on the French coast, you will communicate between the two countries just as easily as you could communicate across the Sound of Mull. Distance seems to disappear in the problem. I have gone so far as to endeavour to communicate between England and Ireland. I have had a circuit made up from Carlisle to Haverford-west on the one side, and from Belfast to Wexford on the other; but we failed to communicate from causes that no one, as far as I know, would have dreamed of. One of the principal difficulties that we have to meet with is the vibrating of the wires themselves across the line of magnetic force of the earth. We all know that the earth itself is a magnet. If you swing a wire and allow a wire to swing even in this room you could get a current that could be made sensible to the whole audience. Now, when you have hundreds of thousands of these wires swinging to the wind you get the lines of magnetic force cut by these wires, currents are set up, and these currents produce noises in the telephone circuits, which quite overpower the sounds that we endeavour to pass between the two countries. That was one cause; and another cause was undoubtedly that on this earth we are receiving constantly electrical effects from other planets, other suns, and from our sun itself. This earth itself is one turmoil of electricity. Do what you will, with instruments delicate enough you can find traces of this turmoil always going on. If any of you would like to spend an evening in a telegraph office, I could give you an entertainment; you could sit

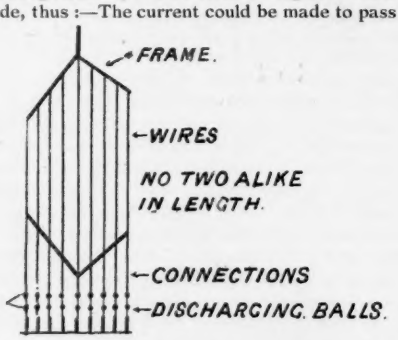
there with telephones at your ears, as I have done on many an occasion, and hear the music of the sphere's strange sounds, some of them very remarkable, and many of them unquestionably owing to effects arising from storms in the sun. Between Lavernock and Flatholme, where this system is in use, we have at the present moment failed to complete to our satisfaction the system of rolling up between the two stations, so that up to the present time we have not handed over to the War Department this telegraphic system. I hope, immediately after Easter, to have the pleasure of handing over this thing complete to the War Department, so that there will then be between Lavernock and Flatholme a perfect system of communication. I say a perfect system, because the signals we get between Lavernock and Flatholme are quite as good and readable, and quite as practicable as though the two places were connected by a direct submarine wire. The question was raised on the paper as to Mr. Marconi having produced something new. I can only say this—and I am one who has studied this matter perhaps more intently than anybody else—that until Mr. Marconi came to me and told me that he had succeeded in designing a system of telegraphy based on the Hertzian waves, there was nothing either uttered or in print that I ever heard of suggesting that Hertzian waves could be applied to Morse telegraphy. He has found a distinct new field, a field which my system does not touch, a field of communication with isolated rocks, light-houses, light-ships, communication between ship and ship, communication between places where the vertical wire is easy, and the horizontal is impractical. I am one of those who have done all I can to assist Mr. Marconi to carry out his scheme. I wish him every possible success. I think if he goes on in the way he is going he will ultimately, and I hope soon, succeed in giving us a system that will get over many of the difficulties which my own system does not surmount.

Lieut.-Colonel H. H. A. STEWART HARRISON (late 9th Foot):—As I have spent five-and-twenty years on this question of visual signalling, I should like, even although it is so late, to say a few words. The lecturer has set a good example by paragraphing his lecture in short sentences. The great want of the mercantile marine of the world is a system of signalling between the commanders of ships. There is no recognised system of night signalling between vessels, and the result is the loss of thousands of lives and millions of property. In one sense this lecture is most unfortunate. It may lead us to relax our efforts, to use the more natural and known means of communication that we have in lamps and the electric light and steam whistles, with the view of preventing these disasters. I quite believe that when this system has become so perfected that we shall be able to abandon the Morse code, and give signals of which *time* does not form an element, that we shall have something greatly to the advantage of humanity; but until that time comes we must rely upon those forces and means which are now at our disposal, and those means consist in the proper use of lights and sounds. The Morse code has been in existence now for thirty years, and at this moment, I believe, there are not a hundred men in the mercantile marine who can read it. In H.M. Navy I should think there are not a hundred men over fifty who can read it, and certainly none (with the exception of a possible dozen or so) who have attained the rank of commanders of our largest vessels, who can do so. The reason is perfectly obvious. Mr. Stewart Bruce has demonstrated that the human eye is so constituted that a series of impressions exceeding a certain number per minute cannot be taken in and interpreted except by the most exceptional persons.[1] In the training of military and naval signallers it requires three months of the most assiduous training to read the Morse code. We want for the mercantile marine a code adopted which shall be able to be learnt in three days by any man from the age of sixty downwards, and until this is done the shameful sacrifice of life and

[1] The shortest time of persistence of vision recorded is ·594 of a second, but the average is 1·36 seconds. See Lecture by Eric Stewart Bruce, *Journal Society of Arts*, 21st January, 1898.

property must continue. In all respects the lecture has been most admirable, but I almost wish the facts it deals with could have been hidden away—concealed until the system was perfected sufficiently to take the place of the present system of signalling. As it is, the laziness, the inertness, of the commercial and the official mind will suffer the sacrifices of life and property to go on, and justify itself on the ground that Mr. Marconi has managed to find a something which in a few years will replace all that we have now and do all that we want. As the vertical wires of the system must be "attuned" in the sending and receiving instruments, it might be possible to make an arrangement by which number signals could be sent as proposed by the Stella code, thus :—The current could be made to pass

STELLA CODE



SENDING AND RECEIVING INSTRUMENT.

in all or any of the wires at will. (The system could be learnt in three days in place of three months.) A point of most essential importance is the discovery of some substances through which the vibrations will *not* pass, not only not pass, but be reflected. They could then be sent in only a determined direction, an absolute necessity in warfare, as all-round signals could only lead to disaster. But I can tell Mr. Marconi, in England his system (as applied to the mercantile marine) will not replace the present for half a century at least.

The CHAIRMAN (General Sir R. Harrison):—Ladies and gentlemen, as no one apparently wishes to come forward to continue the discussion, and as Captain Kennedy is ready to leave matters as they stand, it remains only for me, as Chairman, to say one or two words to you before we part. I came here, at very short notice to take the chair in place of Sir Robert Grant, and I am sorry we are deprived of the benefit of what he might have had to tell us. I do not propose going into the scientific part of what I may call this great invention; for, notwithstanding what Colonel Harrison has said, I cannot help thinking that this invention of wireless telegraphy may be reckoned one of the greatest, perhaps the greatest, that has been made in the century. No one can tell what the future of it may be. When telegraphy first started, we none of us who lived at that time imagined what it was going to do for the country and the world. I think those of us who are living now cannot foresee what the future of this wireless telegraphy will be. I am very glad to think that naval and military officers are working at it. Captain Kennedy in his remarks mentioned Captain Jackson, who is now at Devonport. I had the pleasure and honour of being acquainted with him when I was commanding the troops in the Western District, and I am delighted to think that he is adding to all the other good work he is doing there in connection with torpedoes and pushing on science in the Navy in every possible way. I am also glad to think that the Royal Engineers are not behind in their endeavour to push forward this great science. Captain Brett and also Captain Kennedy are working at it well, and I am pleased to feel that they are able to do so, because I hope, wherever there is work to do, wherever

there is anything to be found out, the Royal Engineers, with whom I hope to be still more closely connected in the future than I have been of late years, will not be behind any branch of the Service in England or any part of the world. I have been much interested with various things in the lecture, and especially with the description of what has been done under the direction of Mr. Preece across the Severn at Flatholme and Steepholme. It happens that those forts there which guard the Severn were under my command when I was in the Western District, and I can fully appreciate the advantage of having some means of communication with those isolated islands, because many a time when I wanted to get there I had to hover about on the beach, having no means of communication with the gunners in the forts. I had to wait sometimes for hours before I could get any boat to take me over that somewhat tempestuous sea. Captain Kennedy has hinted to us what the future of wireless telegraphy may be in regard to the Navy and the Army. I think he has rather favoured the Navy. He has rather indicated that there will be more use for this wireless telegraphy n the Navy than in the Army. At all events, I was struck with one sentence, which I will read. He says that :—"By a slight effort of imagination one can conceive a small torpedo-boat going forth to attack a blockading fleet, driving before it a flotilla of torpedoes controlled by this system of electric waves. But before this can be done there are a few details to be worked out." Now, I also can conceive that ; and in thinking of this fleet of torpedo-boats going out as we have described, I cannot help looking at what I may call the human part of the business, the officers and men who will have to go out in that torpedo fleet. I can imagine what hearts those men must have! How well instructed they must be, how thoroughly they must be up to their work, to attack in that way an enemy's fleet! While I was sitting here the words of one of our great poets came into my mind. Describing the last man standing on this globe, speaking to the sun setting for the last time, he said :—

"What though beneath thee man put forth
His pomp, his pride, his skill,
And arts that make fire, earth, and wood
The vassals of his will.
Yet mourn I not thy parting sway,
Thou dim, discrowned King of Day,
For all these trophied arts
And triumphs that beneath thee sprang
Heated not a passion or a pang
Entailed on human hearts."

Applying that to the engines of war that are made in the present day, what is the use of all these engines unless you have good, thoroughly trained, brave men to use them for the purposes for which they are designed? A country, of course, ought to provide the very best weapons and the very best machines for all the purposes for which a Navy and an Army are intended. But while it does that, it ought at the same time to be exceedingly careful to provide sufficient men to work those engines, and to take care that the men are so trained that when the hour of need comes the engines shall not fail. Victories will always follow where you have brave hearts and big battalions, or perhaps I ought to say in a maritime country, brave hearts and a big Navy. With these words, ladies and gentlemen, I will ask you to give a most cordial vote of thanks to Captain Kennedy for the exceedingly valuable lecture he has given us, and for bringing before us this great subject. I will also thank Mr. Marconi and Mr. Preece and the other gentlemen who have spoken, for their kindness in taking part in the discussion.

LATER DEVELOPMENTS.—During a demonstration in Bristol, on the occasion of the recent British Association Meeting, I had a most instructive experience. In the Great Hall of Clifton College the Marconi receiving apparatus was erected on a raised platform at one end of the room. At the last moment I discovered to my dismay that nearby had been fixed some Roentgen ray tubes

and two large Wimshurst machines. At first all sorts of signals were recorded upon the telegraphic tape, but on my making a suitable adjustment in the length of the vertical collecting wires, I found the apparatus utterly declined to accept any communications not intended for it. This illustrated the "tuning" effect in a remarkable degree.

Experiments are about to be made with a view to connect Dover with Calais by means of Marconi's system, and before the winter is over we shall see England and France engaged in friendly communication across the ethereal channel.—J. N. C. K.

ECONOMICAL ARMY REFORM.

By Major F. N. MAUDE (late R.E.), 1st Hampshire R.E. (Volunteers).

Wednesday, May 4th, 1898.

General Sir W. GORDON CAMERON, K.C.B., in the Chair.

THE discussion which has recently raged in all organs of the Press concerning the principles of organisation of our land forces reveals a very serious national danger, which consists not so much in the numerical weaknesses and deficiencies alleged, as in the bottomless depths of military ignorance the very words of the disputants themselves disclose.

I use the word "ignorance" in no offensive sense: it is no insult to a man to say he is ignorant of Sanskrit if it has not been his special business to master it; and similarly it is no slight on the intelligence of a civilian or even of a regimental officer to suggest that under the peculiar circumstances that have prevailed during the past forty years or so, it has been well-nigh impossible for either thoroughly to master the conflicting principles on which sound organisation is necessarily based; still less can I be blamed for calling attention to the danger the existence of this ignorance involves to the cause which we all have at heart, viz., the provision of forces adequate both in numbers and efficiency for the defence of this country and its dominions.

It is necessary to dwell somewhat at length on the danger involved in this national ignorance of the principles on which warlike efficiency is based. Speaking generally, the popular idea is this—that if the Army knows its work, and is sufficiently numerous, civilians need not trouble their heads further about it; and no doubt in the old days before the rise of "National" as opposed to "Dynastic" Armies this view had much to recommend it. But since the French Revolution let loose the whole manhood of the nation for offensive operations, and Prussia replied by the law of universal liability to military service, the aspect of the whole question has changed; and the events of the past century have abundantly demonstrated that sound military knowledge, disseminated through every class of society, is the absolutely indispensable foundation of all successful military undertakings; and if this holds good in countries in which the Parliamentary system is still so imperfectly developed as on the Continent of Europe, how much more must it apply in our own case where the public

claims, and exercises, a right of interference in every detail of State administration!

It is generally believed that the victories of Germany in 1870 were primarily due to the fact that at every decisive point the General Staff succeeded in concentrating forces of superior fighting strength to those on the opposing side; but this is only a superficial view of the matter, and ignores the driving force which enabled the machinery of military administration to deliver over to the staff the trained and disciplined units they so successfully employed. This driving force was simply educated public opinion, and that this view is correct is abundantly proved by the fact that until this educated public opinion existed, the machinery, though essentially the same in principle, proved incapable of supplying the staff with the required troops either in adequate numbers or with the necessary celerity, as the partial mobilisations of 1848 and 1859 in Prussia sufficiently testify.

French experiences in 1870 point the same conclusion. The organisation of the old Imperial Army had been carefully thought out, and was in many respects better suited to French conditions than the present replica of the German system, but it failed simply because the ignorance of the national representatives had starved and over-centralised the administration.

Our Crimean experiences point the same moral, and America is at this moment learning a similar lesson.

It will be my object in the following pages to trace out the origin of the various misconceptions which collectively make up the ignorance I complain of, and how they inevitably arise during the evolutionary phase through which the Army has been passing for the last thirty years.

At the outset I must confess to a very considerable degree of sympathy with the assailants of our system, as I know very well how in practice our achievements fall short of our ideals. We would each and all of us of whatever arm like to ride at the head of ideal commands and see them obey our every wish and order like perfectly designed machinery; but unfortunately Armies are not machines, and the human element is everywhere present and has to be taken into our calculations.

Perhaps the most troublesome tendency of humanity from a soldier's or reformer's point of view is its liability to growth and decay, and this hits the commissioned ranks most especially, for "Life is short and Art is long," and the "Art" of handling men under all circumstances of a soldier's life takes time and experience to master, even when opportunities are not lacking; but consider how rare our active service opportunities are.

This brings me to what is really the greatest stumbling-block in the path of the well-intentioned but uninformed civilian reformer. In his every-day life he sees around him organisations often comprising numbers as large as divisions and even whole armies—in the case of our railway companies, for instance—developing day by day the same astounding amount of energy, meeting difficulties and overcoming them with an absence of visible friction altogether admirable. The question lies obvious to him, and the apparent conclusion no less so. If these civilian

organisers—railway managers, for example—can deal with ease from day to day with forces of such magnitude, surely there must be something radically wrong with our military administration when it fails so conspicuously—judging by the reports in the daily papers—to attain even approximately the efficiency to which these railways have accustomed us.

They forget, however, two important points, viz.:—first, the general ignorance of military principles of the public who read the papers and whose taste the editors are bound to consider; and secondly, they fail to make proper allowance for the widely different conditions under which the Army and commercial institutions actually have to work.

The broad contrast is this: the Army is organised primarily for war, but remains normally at peace; our great commercial undertakings, railways, canals, etc., are permanently at war, and never at peace.

The railway company, for instance, is always at war against the public, the shareholders, and the elements. The Army is now and again at war with death, disease, bullets, and the public, and must always be ready within a limit of days, dependent on the efficiency of the Navy, to meet the utmost demand that can be made upon it.

To bring the two down to a common basis of comparison, we must imagine our railways, say the North-Western, as a concrete case, working under the following conditions:—

No dividends to be earned, and a minimum of money to be expended for an uncertain term of years. One-half of the staff only to be maintained, but to be capable of expansion at twenty-four hours' notice. Only an occasional train to be run for the training of the staff, and yet locomotives, drivers, permanent-way department, every one down to the greasers, capable of meeting and dealing with the present August traffic at an uncertain date in the future; and even that does not make the comparison complete—the average risk of life and limb to every man throughout the Service must be just one hundredfold what it is at present; but this under the supposed conditions would doubtless arrange itself without further trouble.

Now imagine the working of such a line after twenty years of profound quietude, and with no particular prospect of immediate activity in the future. New engines, new rolling stock, new signalling, and all the consequences they involve, must be provided for; and where is the experience to guide men in their choice to come from?

If the sense of duty were as high in the railway service as it is in the Army, there is no reason to suppose that it would be higher, the best men would be selected to attend the trial trips and spasmodic moments of activity of other railways often acting under totally different conditions; but who is to collate the results, and, above all, who is to select the men to report on them? Let every business man imagine his own concern working under these conditions, and supply his own answer.

A very short study of the enormous amount of material both for and against the existing system contributed to the Press during the past twenty years will suffice to make clear the enormous obstacle to the

question of true reform which this constant breach of continuity, the constant change from peace to war conditions, has always presented.

Roughly, the evidence adduced may be classified under two heads, viz., the proposals of those whose single aim is efficiency in war and is founded on personal knowledge acquired, generally regimentally, on active service; and, on the other hand, the views of those who look only to economy and smooth working in time of peace under the delusion that this alone will suffice to give us fighting power before the enemy.

It is both curious and instructive to note the close resemblance in the line of argument chosen on either hand with the reasons urged in the discussion which raged with even greater fervour in Prussia in 1806-7, and subsequent years, when the system of Frederick the Great had to give place to that of universal service, and again in France in 1871. One might translate letter after letter on either side and the date alone would betray that they were not modern contributions to the discussion of our own circumstances.

The curious thing in all is to note that neither in Germany, France, nor England can one find a paper or opinion which reveals a true comprehension of the really vital principle which was involved in the change from long to short service and the increased efficiency which was ultimately to result therefrom.

In each case the paramount consideration unquestionably was to secure an immediate addition to the numbers of fighting men available at the outbreak of hostilities. No one seems to have realised that the ultimate consequence must be to bridge over the gulf which had hitherto always existed in the peace and war activities of the troops themselves, and thereby to approximate materially to the continuity of conditions under which civilian organisations—as indicated above—develop their very high standard of daily efficiency.

I do not particularly allude to the office work standard of these organisations. On the whole, we have very little to learn from those which approach in extent of their operations the dimensions of the work with which our War Office and its branches have to grapple; but I desire very especially to bring out what I consider the absolutely marvellous collective sense of inter-dependence and mutual reliance—in other words, the splendid discipline, of our railway workers.

For picture to yourselves what is involved in taking a high-speed express through to time over a 100 miles stretch, at a running speed of 54 miles an hour. The driver's life is absolutely at the mercy of each signalman in succession as he approaches him, and yet so entire is the confidence long experience has taught him to place in each and all of them, and so great his own acquired capacity to meet every emergency as it arises, that day by day and night by night these heavy expresses go thundering through to their destination often for years without a catastrophe.

What would not a fighting leader give for discipline of similar quality in his armies! Yet the way towards it lies open, and the only pass-words needed are "decentralisation" and "continuity of conditions."

Let me now endeavour to trace out how the change of system involved these consequences, and to note in passing the difficulties everywhere experienced. When the Seven Years' War came to an end the Prussian Army rapidly approached to a soldier's ideal. On the reductions which followed the conclusions of peace every man and horse physically unfit for work was eliminated, and there remained only men and horses, at their best, horses thoroughly broken and men in the prime of life, almost all with three or four years' active service experience. It is generally admitted that the cavalry in the last few years of Seydlitz's life reached a degree of efficiency far above anything that has ever been seen on any battle-field.

But the inevitable consequences soon began to follow. As men and horses all knew their work, there was very little for the officers to do, the young officers on joining simply drifted into habits of idleness, following the example of their elders as they always do. There were very few recruits, five to seven per cent. for a time covered the yearly waste, and these were handed over for instruction to the older soldiers as they always had been, but there was this difference: whereas in war-time the old soldier had the strongest possible motive to teach the youngster his minor tactical duties, for the lives of a whole troop might at any time on service depend on his efficient performance of them; in peace-time, the first essential was a minute attendance to the details of "soldiering," *i.e.*, pipe-clay, cloak-folding, etc., and war duties did not so much signify. Ultimately, both men and officers grew old and grey together, and long before the higher ranks had passed away the regiments themselves were filled with men and officers who had never seen a shot fired, and simply had grown out of that tactical instinct their predecessors had acquired. And all this escaped the notice of their seniors, owing to the want of adequate opportunities of maintaining touch with their men, and to that curious kind of modesty so prevalent in all war-trained soldiers, who, having acquired their experience instinctively in face of the enemy, come at last to believe that they always possessed it, and that it is common knowledge to the rest of humanity.

The manœuvres, though they still continued to be held, were hampered by the same subserviency to civil considerations and economy which characterise our own, and in the main they had degenerated into spectacular advances in line, and echelon with volley firing and cavalry charges all carefully rehearsed and arranged in advance.[1]

When at last they met the war-trained armies of the Revolution the result was a foregone conclusion. They manœuvred steadily and bore unflinchingly the heaviest punishment, but they could neither feed nor guard themselves, and all spirit of initiative had been crushed out of the subaltern ranks. They were deficient in the very life-blood of an army,

[1] In the appendix to his "Rossbach in Jena," von der Goltz gives the orders for a field day on the Tempelhofer Fields, which occupies several pages of foolscap, and simply had to be learnt off by heart by the unfortunate officers on the days preceding the performance.—See also Prince Hohenlohe's "Conversations on Cavalry."

the power of adaptability to circumstances; the officers relied on the men and the men on their officers; and when the event showed that neither could trust to the knowledge of the other, absolute demoralisation set in, and the whole corps surrendered to the enemy.

This is the most striking instance of the failure of a long-service peace-trained army in history, and if its details had been adequately studied in this country, perhaps a ton of "Letters to the Editor" during the past year would never have been written or published. Nevertheless, old-standing tradition dies so hard, that even after the Napoleonic struggle was over voices still made themselves heard in the military Press in favour of the good old system, and Marwitz instances in his pamphlets on Cavalry in 1816–7 cases of cavalry officers who protested against the drudgery of improvising the training and drill of recruits, and remounts, contending that such menial duties should by right devolve on the N.C.O.'s. We have heard the same thing in England in very recent times.

But the necessities of dealing with the daily labour short service involved soon supplied the needful stimulus, and the dearth of officers due to economic conditions supplied additional pressure. Colonels were simply compelled to delegate responsibility to their subordinates, and these being judged by results were soon obliged to give their whole minds to the education and training of the rank and file, and as a consequence they soon acquired that intimate detail knowledge of their profession which can only come to the average man under pressure of ceaseless responsibility and effort.

As the junior officers grew into closer touch with the men, it became possible to enlarge the area of choice for the staff officers. A man was no longer selected either for book knowledge or by favouritism, for the constant opportunities enjoyed by commanding officers, owing to the systems of inspections, gave them abundant opportunity of selecting those who showed the greatest executive ability at the head of their men, and only a book qualification was retained as indispensable.

Had it not been for the internal friction in Germany—the desperate poverty of all classes and the exhaustion following the great wars and other causes too numerous to dwell on—the whole cycle should have worked itself out in little more than a generation, but as a fact progress was so much impeded that even half the full consequences had not evolved themselves in 1870, but even that half was sufficient to enable a peace-trained short-service army to develop a fighting efficiency, as a whole, fairly without parallel in military history. What the German Army will be when it next takes the field we can only conjecture; but as compared with that of 1870, I venture to predict for it full five-fold greater tactical precision, *i.e.*, a certainty of action on the battle-field far in excess of anything with which history supplies an example, except in cases of relatively small numbers—Rossbach and Leuthen, for example. I have dwelt somewhat at length on the Prussian Army because here we have an unbroken record running for nearly 150 years, showing the causes above alluded to in full operation and developing nearly their utmost

power. Nowhere else can we trace their working so clearly, and nowhere are we confronted with such dramatic consequences. The most perfect fighting machine in existence done to death by 50 years of the tendency to centralisation and an interruption in the continuity of the conditions of employment (*i.e.*, a change from chronic war to chronic peace), and again the rise from unexampled prostration to the acknowledged military leadership of the Continent.

Our own case is necessarily more difficult to analyse, and it need not surprise us to find much confusion of thought, for our little wars have always acted as a check to stagnation and the absence of the pressure of national disaster has served to keep latent that intensity of desire for reform which is so necessary to secure a fair trial for new institutions.

Under pressure of national suffering, the very ablest civilian minds in Prussia were compelled to devote their energies to the comprehension of the principles of warfare, and the same cause obtained for them everywhere willing audiences. In the absence of such pressure in England, our ablest soldiers not only failed to obtain a hearing at home, but found themselves obstructed everywhere by the best civilian intellects in the country, who, never having experienced the real evils of war and its essential brutal facts, were, and still remain, absolutely incapable of coming to correct conclusions on such intricate problems as the organisation of the country's resources for defence present.

Let me endeavour now to trace the successive stages of our evolution since Waterloo.

The army that returned from France in 1816 was undoubtedly in the very highest state of efficiency. Men and officers, arms and departments, had all worked together during some seven years of marching and fighting, and, with the evidence of their brilliant victories before them, it was hard for either soldier or civilian to realise any need for reform.

The Army was placed on a peace footing in the usual manner, viz., by wholesale reductions, and the same consequences as in the case of the Prussians in 1760 immediately began to work—in some directions in an intensified form—for whereas in Prussia, being an exceedingly poor country with no external possessions either to explore or administer, there was no incentive to the officers to leave the Service, Great Britain afforded to the young and energetic officers every species of temptation to cut themselves adrift from the weary routine of the barrack square and devote themselves either to pleasure or sport at home or in the colonies.

Our regimental officers and non-commissioned officers, accustomed to get through the work devolving on them necessarily with full war strength complements on active service, found absolutely nothing to occupy themselves with in the barrack routine, and naturally took as much leave as they could get; and the colonels, being for the most part young and energetic, willingly granted them all they asked for, as by so doing they accumulated more power in their own hands. Where they were not young and energetic, they handed over their authority to the most ambitious youngster they could find, and he had an even greater incentive to help his seniors to keep out of the way and usurp their share

of responsibility. Thus originated the adjutant and sergeant-major's *régime* under which we have suffered so severely, and which, had it not been for our little wars, must long ere this have brought about a national catastrophe.

The few recruits that had to be trained fell naturally to the sergeant-major; and the young officer, being thus deprive of all incentive to master the very bed-rock facts of his profession in peace-time, viz., the process of forging and welding together the units which go to make the weapon the leader wields in war, either idled away their time altogether, or, in the case of the more ambitious, studied the strategical records of the great leaders of history and applied, or endeavoured to apply, the principles they found therein, which were based on the fundamental fact of the existence of a war-seasoned army, to the elaboration of a strategy which presupposed those very qualities of detail knowledge, of cohesion, and mutual trust between officers and men, which, under the new dispensation of chronic peace, were so rapidly passing away.

That this is no exaggeration of the state of affairs that existed previous to 1870—I might easily extend the time limit twenty years further—is abundantly evident to all who have studied the biographies of the many soldiers who, notwithstanding all drawbacks, nevertheless raised themselves to eminence. In the early pages of each and all of them you will almost invariably find some such sentence as the following:—"His active and energetic spirit, chafing under the mechanical routine of the barrack square, busied itself in the careful study of the works of the best authors," viz., Plutarch, Cæsar, Lloyd, etc., and we find him always working what influence he possessed to leave his regiment for staff or other extra regimental duty of a more congenial nature.

Seeing that events have proved that these men, the Lawrences, Outrams, and Nicholsons of the East were actually men of boundless energy and force of character, it is abundantly clear that the routine of the barrack square must have been deadly and demoralising to the last degree or such men would never have exchanged the saddle and the congenial occupation of forging and making the weapon they were to wield in war, for the irksome confinement within four walls on a high stool at an office desk of their own free will and pleasure.

Much has been said of the decay of military knowledge and the idleness and stagnation of regimental life in pre-Crimean days, and conclusions have often been drawn, and indeed are still drawn, by civilian critics, very derogatory to our forefathers and to the whole profession of arms. I am anxious to show that in this matter our predecessors were more sinned against than sinners—that they were the victims of circumstances over which they had no control, and that like causes everywhere inevitably produce like results.

The dearth of interest in current military affairs, for instance, is often adduced as proof of intellectual decay in the Army of those days; but again, the perusal of the shelves of biographies upstairs has not led me to this conclusion. It seems to me that it was inevitable this thing should happen, and I will endeavour to show why.

On the conclusion of the great wars, the details of everyday duties in the field had become a second nature to the survivors, therefore they naturally did not talk about them. Again, a man in the field only knows what passes within reach of his own eyesight for certain, and to dwell on such incidents generally involves a certain display of egotism from which the average British gentleman shrinks; and finally, as all the most energetic and capable men either left the Service or were drafted out to the staff and civil employ, the intellectual level of the residue was bound to sink to the level of the dullest understandings. I have seen the same causes work out their full consequences even in the short period of an Indian hot weather, where heat and depression benumbed our faculties, and I can fully realise all the weariness of existence our forerunners endured, without, however, endorsing the opinion that they were intellectually inferior to their successors.

In point of fact there is ample evidence to prove the contrary, and again I would refer to the biographies, especially to the vast number of them which refer to the days of the Crimea and Mutiny, and which were written by or emanate from the very men who had experienced the depressing influence of daily regimental life, when according to all accounts it was at its very worst.

What these books do show us is a very different thing—they show how widely men of considerable intellectual capacity may differ, and how detrimental such difference of opinion may be where a break of continuity in the conditions of employment suddenly occurs and the State has provided no central school of authority to preserve uniformity of thought and permanence of definitions.

Language, we all know, is in a constant state of change and evolution, and words are constantly receiving new interpretations in the military world no less than in the civil, and my conviction is that nine-tenths of the confusion of military thought, under which we suffered so long and sometimes with such disastrous consequences, primarily arose because men discussed matters starting from totally different standpoints and attaching widely different meanings to the words that each employed.

From such confusion the Prussian Army was saved by the existence of the Krieg's Akademie, and our Staff College now is rapidly effecting the same purpose.

It has been necessary to dwell at this length on this portion of the subject, as without a clear apprehension of pre-existing circumstances it is quite impossible clearly to understand the welter of confusion which arose after 1870 in this country.

Previous to 1866-70 the majority of British military thinkers had maintained an attitude of good-natured patronage towards the Prussian military system, regarding it very much as the French did, viz., as *un espèce de milice*, not to be spoken of in the same breath as the relatively long-service and war-seasoned armies of France and Austria. But these campaigns suddenly revealed the astounding fact that the *espèce de milice* could at any rate evolve within a very few days a numerical strength and fighting qualities, with which the comparatively professional

forces of the two leading military Powers of the Continent were quite unable to contend.

The problem had however to be solved, and the fact that we were compelled to approach it with only hearsay evidence made its solution infinitely more difficult, and this difficulty was not removed, but rather intensified by the appearance of the breechloader in the field as a factor of altogether unknown value.

Some sought the solution in the weapon alone, others in the organisation admitting of such sudden expansion; but none looked for it where it really lay, viz., in the detailed training of men and officers, which the organisation had by its very nature evolved. That this point should have escaped the notice of the average long-service officer need not surprise us; it would, indeed, have been remarkable if it had not done so, for to the man who grew up under the old-fashioned long-service conditions, and had never taught or been directly responsible for the teaching of the recruit in the very A B C of his profession, the soldier was a kind of natural product growing slowly to maturity and greater or less excellence according to the nature of his surroundings, and the more cultured soldier was more prone to this error because the writers from whom he had drawn his knowledge always considered him as such. Let me instance the case of the late General Hamley's explanation and comments on the campaigns of 1806 and 1866 respectively.

Of the processes which evolved the contending armies in either case he tells us practically nothing; but after a short diary of operations, from which we only learn that corps moved from point to point without reference to the nature of the roads, the weather, and the exertions these and similar other variables always entail, he places the two contending forces in position and deduces the consequences from the relative position of their fronts.

Now, with reference to 1806,[1] it is tolerably obvious that since Napoleon possessed a large numerical superiority over the whole Prussian Army available in any case, his ultimate victory was predictable from the outset; but, eliminating this numerical factor from consideration, a look at the positions of the two armies on the 13th and 14th October, previous to the battles of Jena and Auerstadt, will show that of the two that it was the French and not the Prussians who risked most in case of defeat.

The Prussians at least had the open, and, at that time of the year, rich plains of Pomerania and East Prussia, with the sea and certain English and Russian co-operation behind them. The French, if struck in their left flank and headed off at Naumburg, would have been driven off their line of retreat into the barren mountains of Bohemia, and a general rising in Austria and South Germany would have caused the subsequent disaster of Moscow to be ante-dated by six years.

[1] See Clausewitz's letters and "Vom Krieg," also Lettow Vorbeck's admirable study of the campaigns of 1806-7, and von der Goltz's "Rossbach in Jena."

That events did not turn out in this way was really due to the difference in warlike efficiency in every rank of the two Armies. The rank and file of the Prussians helpless in the field from want of proper training, with leaders and staff habitually trained by over-centralisation to shirk responsibility; and the French Army trained before the enemy, from the drummer boys upwards, in the hardest school of warfare the world has ever seen—"for victory or the guillotine" was a stern task-master.

How closely Napoleon and his army skirted the precipice of disaster on that eventful morning very few realise in England; but he won, and his success had to be justified, and since, from time immemorial, military historians had treated squadrons, battalions, and batteries as mere units everywhere equal one to another, there remained nothing for it but to seek the explanation where it did not lie—viz., in the relative positions of the two opposing masses.

Hamley treats the 1866 campaign essentially in the same manner. The Austrians, in accordance with the letter of Napoleonic precept, united their forces before (a very long time before) the chief action. The Prussians moved in two wings to meet them with the intention, in defiance of Napoleonic tradition, to unite on the battle-field, which they successfully accomplished.

Hamley is hard-pressed to find an explanation of Prussian success, and treats us to a long dissertation on the risks that Moltke ran; but Moltke never considered that he ran such risks, for he knew the system on which the whole Army was trained insured him at every turn the loyal co-operation of every element, a co-operation which nothing in the history of the Austrians led him to anticipate.

Similar criticisms without number have been issued by others besides Hamley on German strategy and the events of 1870, but the same fundamental error vitiates them all. None of their authors take into consideration the fact that the conditions of short service are bound after a time to evolve between men and officers of all ranks a mutual trust and confidence of the same nature, though necessarily considerably weaker, than the tie which life in a state of chronic warfare naturally creates amongst the survivors.

Long service in peace-time rots the tie which active service creates, and if we have never as a body suffered the extreme humiliation of wholesale surrender of fortresses and armies, this is due to the constant approximation to active-service conditions our life in India and the Colonies reproduce, and the numerous little wars where death in some form or other is always present with us.

It must be urged, however, in extenuation of those writers on strategy, who so generally contented themselves with a mere counting of heads, or of battalions, squadrons, and batteries, that all through the eighteenth century until the advent of the Revolutionary levies, there actually was but little difference between the individual elements of contending armies and beyond the relations of the opposing fronts, still less variation in the degree of cohesion amongst the units. Higher commands

than the regiment rarely existed, and both armies had time to break in their raw recruits, and get accustomed to their new relations on the line of march towards the frontier. But railways have eliminated this period for adjustment, and the modern system must be calculated to meet the enemy with sufficient cohesion in a few days—even hours—of the outbreak of hostilities.

When the need came to Prussia in 1806 and to France in 1870 to set their military houses respectively in order, both countries enjoyed in one respect an immense advantage—viz., all the survivors had undergone the same experience—climate, weapons, country, all had been alike; and every man, both in the army and in the nation, burned with equal zeal for regeneration. This stimulus was entirely lacking in our case; the nation was quite apathetic about the matter, and a very large number, even in the Army, saw no particular reason or necessity for reform. Moreover, when details came to be discussed, it became apparent that there was no common ground of experience from which to begin. Men who had borne on their shoulders responsible command in the Crimea, for instance, could not be brought to accept the views of casual spectators of the Continental battle-fields; and the survivors of the Mutiny, for example, did not quite see what they had to learn from Ashanti campaigns. Under such circumstances an agreement seemed hopeless, and but for the consequence of the short-service system, which soon began automatically to assert itself, this era of confusion, recrimination, and mutual distrust might have prolonged itself indefinitely.

As the long-service men left the ranks and their places were taken by shoals of boys, it became evident that the training facilities of the old system could no longer suffice for the work. The adjutant and sergeant-major with the best of goodwill could not grapple with it; to add to the trouble, the supply of steady, reliable non-commissioned officers was visibly drawing to a close. At the same time a far higher standard of training was being aimed at, and to secure it there remained no other resource than to delegate authority to the captains.

Before, however, this step could be taken, the captains and officers generally had to be taught on some uniform system; it did not really much matter what; all that was essential being that they should all learn to attach the same meaning to certain words and see correctly the ultimate aim before them; and for this purpose examinations, garrison instructors, and the whole paraphernalia of torture under which the British subaltern for some time groaned, sprang into existence. To meet the need text-books were written, admittedly to order. They may have been good, bad, or indifferent—I express no opinion one way or the other—the examiners and instructors may have been, and no doubt were, of all intellectual calibres; that again does not signify. What alone signified was that the compulsory study of these books under this guidance compelled us all to call things by the same names, and thus establish a mutual basis from which one could start for the discussion of any given military problem; but discussion awoke interest, and with interest began independent research, with results in military literature of

all kinds, both ephemeral and permanent, which will bear comparison with any work done in recent years on the Continent. I would ask anyone interested in the matter to turn over the JOURNALS of this Institution for the past twenty-five years or so, and note the advance our later volumes show in accurate information and grasp of the subjects treated. The confusion of tongues which so long held us back in pre-Crimean days is at length a thing of the past, and there seems every prospect of a fair consensus of opinion on all matters of principle being reached throughout the Army in a very few years; it will unfortunately take at least another decade to filter down to the newspaper editors and their war correspondents.

With the extension of knowledge on a uniform basis came step by step growing interest and better results from the company and squadron training. These were the indispensable corollary of the short-service system, without which it could not thrive; for in no other way is it possible for the men to acquire confidence in their immediate superiors, or for the superior leaders to obtain that intimate knowledge of the men and their needs and requirements on which all true efficiency depends. The days are long since past when the young officer could, and did, rely on his N.C.O. for the correct word of command, and I, for one, am not sorry it should be so.

The young officer nowadays who wishes to succeed in the career he has chosen has to realise, and a very large number most decidedly do realise, that personal command can only be acquired by absolute personal superiority both in knowledge and character, and appreciates fully the nature of the responsibility now placed upon him. But what has hitherto broken his heart was the fact that though the responsibility was there, the opportunity of thoroughly mastering that responsibility was denied to him. The miserable system of annual drafts exceeding the capacity of the regiment to furnish year by year to the other battalion gave neither men nor officers a chance of learning mutually to understand one another, and the consequences have been like a weight of lead around our necks. I do not believe that one man in ten of the better type of young officer ever in the least grudged the work expended on training a good draft for the "other" battalion. In due course it would happen that he would be in the "other" battalion, and have in turn to depend on the goodwill of some other brother officer; but what one and all did hate and resent was the hateful task of being put to a job beyond human strength and being asked to compress the whole of a full year's work into the space of a short six months. Such a demand merely led to a species of "cram," which was detestable both to officers and men, and in so far as there is a real dearth of recruits this miserable system must take the blame of it.

You can make men work but you cannot drive them, for the capacity to absorb and digest instruction is limited, and with the best will in the world the recruit cannot take in more than a certain degree of instruction in a given amount of time; the attempt to do more leads to bullying on the part of non-commissioned officers, and stolid obstructiveness on the

side of the recruit, and where such conditions are known to prevail the desirable class of recruit passes by on the other side.

The recruiting difficulty is now our most pressing problem, and its solution will ultimately be found in the re-adjustment of the annual demands on the home battalions. When once this re-adjustment is effected I believe a very rapid improvement will ensue, for when officers take an interest in their men (and they can only do so if time is given them) the men are quick to respond, and when once a good understanding prevails the company or regiment becomes a comfortable home, its merits are widely extolled, and recruits hasten to flock to its colours. Neither need the question of employment on discharge affect them, for where this tie of common interest exists the sensible man knows that he will have the collective interest of his officers, both past and present, to place him on retirement, and feels as a consequence but little anxiety as to his future. All these reserve employment agencies are however only in their infancy, their development having hitherto been checked and harassed by the destruction of all community of sentiment in the home battalions, primarily due to the excessive strain placed upon them and the extraordinary imbecility of the custom of checking the enlistment of men for a particular corps, in anticipation of the coming deficiency bound to occur when the next draft sails.

Hitherto we have been in the predicament of a manufacturer whose daily requirement of power has outgrown the capacity of his boilers to supply, and who to meet the excessive demand has had to force his fires with all the detrimental and uneconomical results such a proceeding implies; but the recent augmentation sanctioned by Parliament are equivalent to an increase in boiler power, and we can now revert to more economical methods. Though, for one, I should have gladly welcomed a far larger increase in the mounted Services than we have obtained, I admit that the increased establishment of men in the infantry should fairly meet our present needs, and I venture very confidently to predict that the next few years will mark a rate of progress far in advance of anything we have yet experienced.

Our former difficulties are more than sufficient to account for the unprecedented outburst of grumbling of the past few years, for the efficiency of armies is primarily a question of human nature, and you cannot indefinitely increase the load on human shoulders without incurring resentment.

Even as it is, the past is not without its compensations; the best of our young officers have had opportunities of showing their capacity for hard and unremitting labour, and they may rest assured that their efforts to grapple with it will not have been made in vain. The tasks that lie before all of us when the Great War comes will be no light ones, and the experience many have of late perforce acquired will stand them in good stead when it comes to the preparation of forces on a scale adequate to give the "knock out" blow to one, or other, or both of our possible enemies across the water, for it is not our two or three little army corps which will suffice to complete the task our Navy must begin.

When I first applied for permission to deliver this lecture, I was of course unaware of the extent of the proposals the War Office intended to submit to Parliament, and I drafted this paper with the object of driving home the evils resulting from the previously existing inequality of home and foreign service establishments to the utmost extent of my powers. When, however, Lord Lansdowne's scheme appeared, I re-wrote the whole paper and thought of changing its title, as the most difficult dead-point in reform has now been surmounted; but on consideration I still retained it, for there is yet one other step to be taken if reform is to be hastened, and that is the final official recognition of the independence of the company and squadron commanders in the same sense and on the same lines as their independence is recognised now throughout the whole of the Prussian Service, in our own Artillery and amongst the Engineer troops and companies.

The secret of modern German efficiency, I believe, lies entirely in these two fundamental principles, which you will find embodied in all the best of the modern German military literature and their regulations, viz. :—"The responsibility for the *drill* efficiency of his men lies entirely on the shoulders of the company commander," and "the battalion commander commands four captains," not 1,000 men.

How the German officers fought for the recognition of these two fundamental ideas I have indicated above, and they ultimately obtained them, because, under the intensified conditions of short service existing in Germany, such independence was a necessary corollary of the principle of universal service—as indeed it is of any form of short service at all.

But the need is by no means so obvious under our own conditions, and without official recognition years may elapse before experience forces it home upon us, for the immediate consequence of the removal of the inequality difficulty will be to put the necessity for this step in the background, for, as the pressure of work in the companies is diminished, the opportunity will again arise for the battalion commanders to centralise; and unless this is checked by a tour of active service, a strong-willed and able man may, by re-establishing the battalion *régime*, throw back his captains by twenty years at least, for a strong commander may easily leave his mark for good or evil on a battalion for a full generation after his time of office.

There is nothing whatever at variance with English tradition in the step I plead for; neither is there anything in the nature of our young officers which renders success at all doubtful. On the contrary, our history everywhere shows that our young men may safely be trusted with responsibilities under which foreigners of all races are apt to succumb. There is hardly an historian, either of our commercial enterprise or our colonial empire, who fails to drive home as the one essential factor of our hitherto unchallenged supremacy precisely this one quality—the strength to assume responsibility; and since civilians recognise it in their own sphere, and we are well aware of its success in the Navy, the Artillery, and the Engineers, why should we hesitate to concede it to the Line and Cavalry, who are after all of the same flesh and blood as the other

Services, and, in my opinion, by no means their inferiors in true intellectual capacity?

Let me speak openly in this matter for once, and tell the truth, the whole truth, and nothing but the truth, without partiality, favour, or affection. Our peace-trained battalions and squadrons have never yet reached a degree of efficiency comparable with that of our Navy or Artillery, and the sole cause for this relative failure has been that we have deliberately sacrificed the very strongest and most reliable factor in their composition. Instead of training our subalterns to rejoice in responsibility, we have taught them to shirk it, and, as a consequence, when at last the evil day could no longer be postponed, and the whole crushing load entailed by the command of 1,000 men, or 500 men and 500 horses, has descended on the survivors, many, very many, have bent beneath the yoke and gone under.

A man's character requires development exactly the same as his muscles. Sandow could no more raise his 380-lb. dumb-bell without previous practice than he could command the Nile Expedition with no more previous experience than twenty years' service in the old-fashioned adjutant and sergeant-major's regiment would have given him.

You need fear nothing in a bold advance, the records of our many recent little wars—Burmah, Uganda, West Africa, the Nile, and the North-Western Frontier—all show you what the officer is capable of, given his chance early; but if you want a peace-time example let me call your attention to the 19th Hussars, under the late Colonel Percy Barrow and Colonel French. It was my good fortune to be attached to this regiment after completing the Staff College course in 1891, and judged by the highest standard of Prussian precision in drill and manœuvre, it was absolutely above reproach. To realise all that this means it must be remembered that the new system had to be introduced in Egypt almost in presence of the enemy—that on return to England the regiment had been reduced to the lowest establishment, and as a consequence all that wonderful system of remount training, the result of uninterrupted years of peace in Prussian regiments, and the very bed-rock on which their marvellous accuracy of movement is based, had been to them impossible; and finally, that at the time I was with them they had not a man under the rank of corporal over two years' service, *i.e.*, six months less than the average of the Prussian regiments; and those who can appreciate all the additional difficulty and friction these adverse factors necessarily entailed, will I think agree with me that no more brilliant example of what a good system can accomplish when sensibly administrated could well be desired or obtained.

And the advantages you will obtain will not cease with the regiments. Good company or squadron officers mean contented and happy commands, and happy commands mean ample recruits. A good company or squadron commander may be safely selected for staff training, and from the staff graduates in peace-time commanding officers of all grades must be selected.

Does the War Office evolve the Army, or does the Army evolve the War Office?

I believe that a healthy Army evolves an efficient administration, and that every Army has the War Office it deserves, and for the following reasons.

Every human organisation—unless animated by some exceptional sentiment, such, for example, as is evolved in men who directly command fighting men—tends after a lapse of time to settle down into a routine that accomplishes the work demanded of it with least effort to its constituent particles. Thus, if any particular check shows itself in practice to provoke more bother than it is worth, human nature quietly sheds it. If, on the other hand, the absence of that particular check leads to constant correspondence and recrimination, on grounds of self-interest it will be immediately introduced.

Enthusiasm and sentiment have, and can have, no place in a clerical organisation, but both are compatible in a fighting Service; and in proportion as they are founded on and guided by sound principles, it is in the interest of the clerical organisation to encourage them.

Opposition, therefore, to sound reform will never come from the administration. When the latter appears to obstruct, the real reason will generally be found in the fact that the accumulated experience of the administrators, which must of necessity exceed that of the reformer, shows that the particular branch of the Service affected is not yet ripe for the change advocated. As soon as it is ripe, then, in their own interests, the administrators will adopt it.

That this generalisation is correct, anyone may satisfy himself who, with a fair knowledge of our own War Office machinery, will undertake the study of the relations between the Army and the War Ministry in France and Germany respectively.

Lieut.-General Lord METHUEN, K.C.V.O., C.B., C.M.G.:—I have not the least wish to speak on this lecture because I only knew of it a few hours ago, but I do so out of respect to the Chairman, as I think there should be some discussion, and also because the lecturer has asked me to say a few words regarding the youth of the men in the late Tirah campaign. How far the lecturer carries out the heading 'Economical Army Reform" I will leave to the Chairman to allude to later on. There are only two points on which I wish to give any opinion. The first is with regard to the responsibility thrown upon young officers. I do not think in any branch of the Service can this be seen to greater advantage than with those officers who belong to the native regiments in India. I have been enabled during my service to see the work done by a very large number of officers, and I can safely say that I have never yet seen a body of officers that impressed me more than those I saw with the native regiments during the Tirah campaign; and the reason, I think, is that they give to them exactly what the officers have given to them in the Navy, namely, very great responsibility when they are young. As you know, there are very few British officers with the regiment, and therefore from the time they join they are always commanding a large body of men. Then the second point is with regard to the work done by the English troops in the Tirah campaign and their youth. So far as the work done by the men is concerned, I think it is the same as any work done by British troops, whether in Egypt or at the Cape or

elsewhere, it is perfectly certain to be done to the very best of their ability, and I think that the conditions under which that campaign was carried out were, to say the least of it, difficult and hazardous. I have no fault whatever to find with either the physique or the spirit that animated those men. My only question is, how many men there were left at headquarters who were not in possession of that physique which we wish to see English troops possess. That, I think, is a question which ought to be gone into, and it should be seen whether the statement made by the late Sir Henry Havelock-Allan was correct, when he assured me that in the Indian Mutiny, out of a battalion of 900 men, with the exception of those men who were in hospital, every man in the battalion was available. If it is a correct statement I should very much wish that the same could be said about the battalion now serving in India.

Lieut.-Colonel A. T. WINTLE (late R.A.):—I was glad to hear the lecturer say that he believed that the women of America made the men fight, because I am inclined to think that it is always the women of every country who make the men fight. I have heard that in the Boer campaign the Boers themselves would not have fought if it had not been for the women, and I am quite sure it is the women of the East who make the Hindoos and Mohammedans, and will make the Chinese, fight. I read this morning that "he only is brave who has affection to fight for," and this I am sure is the case in the real battles of life. I have often thought now there is so much discord in England that it would be well to know what we are fighting for. In the old days people were disposed to fight not only for the development of courage but also for the protection of the poor and peaceful. We do that still to a certain extent, but then that is not done everywhere. At any rate, in India during the Santhal rebellion before the Mutiny the people said that it was the duty of the Government to be guardians to the weak and peaceful; they said they had no objection to the sahibs themselves, but if they would not protect them, they must protect themselves. The lecturer spoke about German conscription. The disadvantage of short service, to my mind, is this: that under conscription you will get a great many men who will have no heart in their work. Another thing, I have heard that some of the men who are turned out at the end of their short service become burglars. An officer told me that he had found that so. Of course that is a matter for the civilians to take into consideration, because that really means that England, in course of time, will become just the same as India was in the time of the Pindarees. A remark has also been made about the Germans rising after defeat; but that is a peculiarity of the Aryan race that they always show best when they are in the greatest difficulties.

Colonel W. T. DOONER (Commanding 87th Regimental District):—I will only detain you a few moments while I refer to the statement of Major Maude. In the first paragraph of the summary of his lecture he mentions:—"The general consensus of ignorance on all points both of principle and detail revealed by all disputants, on whichever side they may have ranged themselves," in this matter of Army Reform. The lecturer in explaining them referred to Mr. Arnold-Forster and that gentleman's recent letters in the *Times*, and said it was ridiculous to argue—which we will all agree with—that because a man was only 19 years and 11 months and perhaps some few days old, that he was therefore not fit to be put into the fighting ranks of the Army. But I think, perhaps we soldiers ought to defend Mr. Arnold-Forster a little for taking that line of argument, because you will recollect that his letters were more or less in reply to and had some sort of reference to the dissent that was made by Sir Arthur Haliburton to the report of the Wantage Committee, and that Mr. Arnold-Forster was in a measure bound to adopt the same argument. Sir Arthur Haliburton, in his somewhat long dissent, and also in his recent letters to the *Times*, argued that because men were 20 years of age as shown by their attestations they were therefore necessarily fit to take their place in the ranks and to go on active service. He

also produced some very long tables and figures and endeavoured to show from the number of Reserve-men which would be required in the ranks of the French and German Armies on mobilisation, that we were in a better position, and would require less Reserve-men than the Armies of these countries to get our battalions up to war strength. But Sir Arthur Haliburton missed a very important point viz., that very many of our men are not really eighteen when they enlist, whereas in the French and German Armies the age is conclusively proved, and in the German Army men are not considered fit for active service till the end of their 20th year of age. I venture to think that Mr. Arnold-Forster, in trying to bring the state of the forces of the Crown before the public in the way he did, deserves the thanks of all military men, because he has certainly drawn great attention to the Army and its requirements. This argument regarding the twenty years of age is always used, and why it should be so is a little difficult to understand. I enlist some 400 or 500 men a year, and I think the system of going by their ages as a guide for being fit for active service is very inaccurate. If a well-developed, well-built youngster enlists who is only 18½ or 19 years of age, of course he would be fit as soon as he knows his drill, etc., and has learnt how to shoot by going through his course of musketry. As you all are probably aware, the authorities have recently issued a regulation that all efficient soldiers of 19 years of age are to receive an increase of pay, and therefore I imagine it is intended and will be recognised in future that, if a man is actually 19 years of age and is well developed, in fact physically fit in every way and thoroughly efficient, he will be considered fit for the fighting ranks of the Army, and there is no reason why he should not be so; as strength and efficiency will I hope be the test, not age. I only venture to say these few words in defence of Mr. Arnold-Forster, because I think by the letters he wrote to the *Times*—some of his statements possibly many of us will not agree with—he was to some extent instrumental in bringing about many of the changes which have recently been made. Take, for instance, the increase to the strength of the home battalions which has been decided on, so that we will hope in future that they will be able to furnish the necessary men for the drafts for the foreign battalions without undue depletion, and if mobilisation were ordered that the number of Reserve-men required to make them up to war strength will not be too large. There was one other note I made with regard to a subject referred to, viz., concerning "boys" in the Indian battalions. In the different corps which took part in the recent campaign on the North-West Frontier you might, I think, have counted the number of what are really boys on the fingers of both hands, because now no soldier is sent to India to join the foreign battalion until he is over 20 years of age. I do not say they are all actually 20, but certainly all except band boys must be over that age, as shown by their attestations.

The CHAIRMAN:—Or have two years' service.

Colonel W. T. DOONER:—Yes; the order to embark usually has some other condition regarding service.

The CHAIRMAN:—That is the alternative, 20 years of age or two years' service.

Colonel W. T. DOONER:—I think the order usually varies in accordance with the requirements of the foreign battalion; but all I wish to draw attention to is, that under present orders all men serving in the recent operations on the North-West Frontier were officially over 20 years of age, and that the great majority must have been considerably older; under our present regulations this must have been so.

Major MAUDE, in reply, said:—I must admit that my lecture was both discursive and historical. The fact is, to deal with the whole problem involved would need a big heavy book crammed with figures and references; and all I could do in the time at my disposal was to indicate lines of thought which, when applied to the subjects as they are raised from time to time in the Press and

Parliament, will show the correction to be employed for "personal error' in each particular speech or letter. I have treated the Army as a "growth," nct a "creation," and tried to show the acts of our forefathers working out their consequences unto the third and fourth generation. The idea is novel, no doubt; but, like Mark Twain, when he proposed to reform the German language, I should like to have the credit of it. I did not dwell on my conclusion, simply to avoid taking up your time, and to my mind it appears obvious. I submit that our recent reforms are steps along the right path, and if supplemented by the official recognition of the independence of the company and squadron commanders, a very rapid increase both in excellence and uniformity will immediately ensue. To estimate the value of this increase numerically is difficult; but since the strength of a chain is the strength of its weakest link, I should calculate that the levelling up which must inevitably occur throughout the Line, Cavalry, and Staff would at least quadruple the fighting value of the whole Army, and to achieve such a result at the expense of a sheet of paper and pen and ink would be a very satisfactory economical result to arrive at.

The CHAIRMAN (Sir William Gordon Cameron):—I was in rather a difficulty at first, because although I, and I am sure everybody present, must have listened with very great interest to this lecture, it seemed chiefly of an historical nature, leading to no particular questions to discuss. But I understand now, from the remarks which the lecturer has made at the termination of the discussion, that the point really before us is whether the authorities are doing the right thing for us at the present moment as regards raising the Army in numbers and efficiency commensurate with the increased requirements of the Empire. As far as my own opinion goes, I think, with many other officers, that the only way out of our difficulties is to carry short service a step further. I have lived under every sort of dispensation. My experience on the Active List, I am sorry to say, covers a period of nearly 51 years, all spent either in regimental work or as general commanding at home and abroad, and I have certainly long come to the conclusion that there was nothing else to be done but to adopt a system of short service if the necessary number of recruits is to be got. The difficulty has hitherto been to make enlistments for three years (as in the Guards) applicable to Line regiments, and it is now proposed by Government to partly meet that difficulty by enlisting a certain number of three-years men in every regiment (100, I think) for service in the home battalion only. This, together with increased home battalion establishments, will greatly relieve the strain upon them of feeding foreign battalions, whilst at the same time improving our position for home defence. There is no time for many details, but I think, on the whole, that the system which has been now proposed by Government is the most workable under the circumstances. As for getting older recruits, which everybody would so much desire, it is absolutely impossible under the voluntary service system. You must take men at the idle ages. When I was in command of the Northern District before it was divided, and with half the recruiting districts in England under my command, I found that eight men out of every ten recruits were either out of employ or very young men who had not entered upon any trade or business in life; and that always was and always will be the case I think with voluntary service, long or short. But I think we are going now to do about the best thing; I do not agree with those who go in for paying the private soldier (who is provided with nearly everything) at anything like the rates of the ordinary labour market. That I think is absolutely out of the question. I am all for raising the position of the soldier as far as practicable in order to make his life as happy and bright as possible, and to give him a reasonable amount of pocket money always at his command; but when you come to some of the recommendations which have been made with regard to paying the soldier you must recollect that in time of war, when all the Militia and Volunteers are called out, as in 1805, we should have a very large army on foot, and if those men were all paid at the

high rates that some people would recommend—well, we should increase our National Debt to a very considerable figure in a short time. There is one thing, of course, we must always guard against. In a voluntary service like ours there is always a tremendous amount of talk about what you call "popularising the Army." You have to be very careful in popularising the Army in order to attract recruits, not to do it at the expense of discipline or the severe amount of training now absolutely necessary for efficiency in European warfare. That is always the thing that you have to guard against; it is one of the great dangers. Another great danger that you have to guard against is to think too much of our small wars. The Prussians fought their first battle of Sadowa (I was not thinking of the previous small Danish campaign), and they fought that battle very nearly as well as any battle that they fought during the latter part of the Franco-German War. The easiest troops the Germans had to contend against, I think I am right in saying, were the French troops, who had had a great deal of war experience in Algerian fighting against barbarians. The two things are absolutely different, and you must not suppose that because officers and men have had a good deal of experience in our small wars they can dispense with the perpetual instruction considered necessary to fight a European enemy. That I have always considered a great danger. I recollect the Press at the time the war broke out between France and Germany maintained with much unanimity that the French would beat the Germans because the Germans had had no war experience. The lecturer has drawn particular attention to that thorough system of squadron and company training which is the very soul of military efficiency in the field as regards the regimental officers and their men—the big spectacular drills and manœuvres, to which the public apparently attaches paramount importance, being chiefly for practising generals and the staff in handling large masses of troops. From long experience I cannot say that such squadron and company training has reached a high standard of excellence or receives all the attention it deserves. The first point that I think the lecturer alluded to was the utter ignorance on the part of the British public of military matters, and he tried to explain how that was. I quite agree with him. I think that is one of the things that we have to take in hand. You find the subject of home defence nearly always carefully avoided in all electioneering speeches; I never read of anybody who tries to instruct the public with regard to home defence. I think that the more the public is taken into our confidence the better. I always used to say when I commanded the Northern District—and was a great deal in contact with the public there—that the chief thing we wanted was to take the public thoroughly into our confidence. I believe that there is in no country in the world a stronger spirit of patriotism among all ranks than there is in this country. I believe the working classes and the middle classes are just as anxious for the safety of the country as the upper classes, and I think all we have to do is to take every opportunity of explaining what most of us behind the scenes believe is our very defenceless state. In England the Army is what the nation makes it; and I thoroughly believe if we do what I have just mentioned, and every opportunity is taken of talking to the working-men and the middle classes, there will be a far better condition of things. I think I have touched upon nearly all I wanted to say. The question of compulsory service, I think, was not part of the paper, and therefore I will not make any remarks about it. There has been a good deal said with regard to the double-battalion system. All I can say is, from long experience, that it is absolutely necessary that the home battalion should be to a certain extent a feeder for the battalion abroad. The home battalion ought, however, to be sufficiently strong to admit of the necessary drafts being sent out to India and elsewhere without unduly weakening the home battalion. But you must recollect that directly the short service was introduced you always had a large number of men who could not go abroad, especially to a battalion in India; for a man must not be within two years of the expiration of his colour

service, and he must also have two years' service or be 20 years of age. Thus, of course, there must be a lot of men left behind, and those men belong for the time being to the home army. They must be trained and kept in a thoroughly efficient state, and that cannot be properly done at the depôt, but must be done with the home battalion. I have listened with the very greatest pleasure to the lecture. I have learned a good many facts which will be very useful in the future. There are very few of the arguments which have been brought forward with which I do not thoroughly concur, and I am sure we are all very much indebted to the lecturer, for whom I call upon you for a hearty vote of thanks.

ABYSSINIA AS A FACTOR TO BE CONSIDERED BOTH IN THE RE-SETTLEMENT OF THE SOUDÁN AND IN THE FUTURE OF THE RED SEA.

By V. FEDOROFF.

Translated from the Russian by Lieut.-Colonel W. E. GOWAN (late Indian Army).

"In the coming partition of Africa, Abyssinia will naturally play an important part. To what European Power will the Ancient Empire of Ethiopia eventually belong? Will the Italians succeed in extending the firm footing they have gained in the Red Sea,[1] or will the French put in a claim from the side of Obock? Problems such as these are of the highest interest for those of us who try to live in the future as well as the past." —*The Sacred City of the Ethiopians, being a record of Travel and Research in Abyssinia in 1893, by J. Theodore Bent, etc.*

THE beginning of the political life of Abyssinia is lost in the gloom of remote antiquity. She was one of the carriers of ancient civilisation, and, as such, was the equal of Egypt, Phœnicia, Assyria, Babylonia, Media, and Persia. Although no regular excavations have as yet been carried out in Abyssinia, yet, from not a few finds made, it is apparent that, in prehistoric ages, the civilisation of Abyssinia was not second even to that of Egypt, and there exist grounds for the belief that even during the lifetime of the constructors of the Pyramids culture in Ethiopia was at the same height as on the banks of the Nile. Later on, Egyptian civilisation took complete possession of Abyssinia, and traces of this are even now to be met with in Shoa. King Abrago-Dzu-Menar, who ascended the throne of Abyssinia in the year 1447 B.C., is the first historically accurate personage in Abyssinian chronicles. His descendant,

[1] The crushing defeat of Adowa and the dissipation of all dreams of Italian conquest and extension in this part of Africa, at least, have answered this question in the negative. As to the second question, the following announcement made from Odessa, under date September 16th, 1898, is of peculiar interest, since both French and Russian interests are as antagonistic to our own both in the Soudán and on the Red Sea littoral, as they are in China and the Far East generally:—"It is stated here that since the battle of Omdurmán lengthy and special instructions of a secret nature have been transmitted by the Russian Foreign Office to M. Vlassoff, the Russian political agent at Adis-Ababa. It is generally surmised that M. Vlassoff has been directed to offer certain advice to the Negus Menelek in the event of possible complications arising between Abyssinia and the Sirdár, should the latter push his power beyond given limits to the south and east of Khartoum."—W. E. G.

in the direct line, Goddat, died in 1008 B.C. He was succeeded by his daughter, Balkis, or the semi-legendary Queen of Saba or Sheba, who, according to Abyssinian stories, had a son, by King Solomon, named Menelek. During the whole of the pre-Christian period of her historical existence, Abyssinia was in continuous and close connection with Egypt, the Soudán, and Arabia proper. It was only from the time of Queen Balkis that Abyssinia entered into more or less intimate relations with the then powerful Judea. Thus the Menelek, above spoken of, went to Jerusalem for the purpose of being crowned King of Ethiopia, and from there he took back with him a copy of the Ark of the Covenant which stood in the Holy of Holies in Solomon's Temple. This copy is still preserved in one of the churches of Aksum as the greatest of the sacred relics of antiquity. These relations with Judea exercised, however, but little influence on the religious beliefs of the Ethiopians, who remained, as before, Pagans, or more probably, Sabœans, *i.e.*, worshippers of the heavens and the various constellations, and in this they resembled their neighbours, the inhabitants of Arabia proper. Only a few of the Abyssinians became adherents of the Mosaic Law. There are reasons too for the belief that the Phœnicians, who traded along the coasts of the Red Sea, introduced their cult and their divinity (Ezion-Geber, for example) into Abyssinia. During the heavy days which overtook Judea, masses of Jews emigrated to Abyssinia, where, under the name of *Fallashas*, *Fendjas*, *Tsalans*, they have, even until now, preserved, in a remarkable degree of purity, their own type, language, belief, and customs. The descendants of King Menelek ruled over Abyssinia up to the year 584 B.C.

The ecclesiastical traditions of the country tell us that Christianity was introduced into Abyssinia by the Apostle St. Philip, but it is more credible to suppose that it was introduced by St. Frumentius. Kings Edesius and Elezvoi may also be justly called the Apostles of Abyssinia. In the year 331 A.D., Saban ascended the throne and he announced Christianity to be the State religion of Abyssinia. Abyssinian Kings had also endeavoured to carry the light of the Christian faith far beyond the limits of their own country, and the campaign of St. Elezvoi across the sea into the deserts of Arabia may be called the first Crusade of the Cross in the East. But however weak the Abyssinian Church itself may have been, it might, in dependence on its own strength, have carried Christianity into Central Africa, had not the triumphant creed of Islám prevented it from doing so. Subordinating herself, in a spiritual sense, to the Church of Alexandria, Abyssinia took an active part in all the religious struggles of the first ages of Christianity, and in so doing was always on the side of her own Metropolitan. In the fifth century A.D., Eutyches, who dwelt at Alexandria, began to teach that Jesus Christ possessed but the one nature—the Divine—and in this way he laid the foundation of the heresy of the *Monophysites*. The Egyptian Church was at that time ruled over by the Patriarch Diaskor, and after him the Abyssinian Church accepted his teaching; but almost the whole of the rest of the Christian world, especially the Byzantine Church, in the

person of Flavianus, Patriarch of Constantinople, rose in opposition to it. In the year 449 A.D., Diaskor assembled, at Ephesus, a local council, better known under the name of "the robbers' council," whereat Flavianus was practically condemned to death. In 451 A.D., at Chalcedon an Œcumenical Council was convened under the presidentship of the Patriarch Anatolius, and by it Eutyches and Diaskor were unanimously censured. The Monophysites refused to acknowledge this decree and also the decision of a fifth Œcumenical Council held in 553 A.D., and declared themselves to be the sole true body of Christians. They then formed themselves into the special Coptic Church of Alexandria. In consequence of the religious intolerance of those times Byzantium and the Western Christians broke off all relations with Abyssinia, and so even her very existence was quickly forgotten. Although the Abyssinian people and the Copts, with whom they had united themselves, were excommunicated by the Œcumenical Council and although they had outwardly become Monophysites, yet they did not altogether forsake the chief dogmas of the Apostolic Faith, and therefore did not completely embrace the teaching of the Coptic heretics.

At this period Abyssinia stood at the highest point in her economic and spiritual development. The written laws of to-day are witnesses to this fact. Stretching from the Nile to Cape Guardafui, occupying the plateaux of Kaffa and Harrar, embracing also a portion of the great lake basins of the Egyptian Soudán, and with uninterrupted access to the Red Sea, Abyssinia at that time appeared as a most powerful African State, and served as the medium of communication between the West and Eastern Africa and the Indies beyond. The ports of Massowah, Zeula, Assab, Tajura, and Zeila were crowded with vessels from India, Arabia, and other countries, whilst large caravans unceasingly traversed the now inhospitable province of Samhara and the country of the Afaras.

After a brief possession of political power, in the eighth century—that epoch of political and religious disturbances, brought about by Muhammad and his heirs—there set in for Abyssinia heavy days. The Arabs invaded Egypt, and soon afterwards semi-barbarous Mussulmán races poured over the whole of Abyssinia; and though she, after a long struggle, succeeded in standing out for her independence, she was cut off from the sea, and was thus destined to undergo a period of stagnation and of intellectual degeneration. It may, however, be said that Abyssinia checked the triumphant advance of Islám in the centre of Africa, and arrested it, too, on the south-east just as Spain did on the north-west. Cut off from the whole world during the course of many centuries, Ethiopia stood alone trusting wholly to her own weak powers, and this without hope of brighter times. It cannot be otherwise, therefore, than surprising that under such terrible conditions Abyssinia should not only have preserved her independence, but should have also maintained, in its pristine purity, her faith, customs, language, and nationality. For this she was, of course, indebted above all to the stability of those religious foundations which had been laid by St. Frumentius, Elezvoi, Edesius, and other apostles of the Abyssinian Church. The same firmness and devotion

to their ancient faith were displayed by the Abyssinian people not only in their struggle with the Jews, but with that Western European propaganda which, almost from the twelfth century, had begun to invade Ethiopia. As far as she could do so, Abyssinia steadily endeavoured to draw near to her own brethren in the faith, as she so regarded Greeks, Muscovites, and other Eastern Christians; and she more than once sent her envoys to Europe, and even to Russia; but what could she do if her elder brethren remained blind and deaf to the requests of their younger brethren? Having vigorously declared themselves at the Florentine Council to be the adherents of orthodoxy and not Latin schismatics, the Abyssinians could not expect from the Western Church other aid than that of missionary propagandists, whom they did not desire even to know. From the tenth century the Abyssinians had become the sworn foes of Islám, the authoress of the decay of their fatherland. The further history of Abyssinia is a record of bloody and merciless wars with Mussulmáns on the north and west, and with Gallas on the south. In the thirteenth century the dynasty of Zagei came to an end, and in the year 1300 A.D., King Yakob-Amlos, the founder of the third reigning house of Abyssinia, transferred his capital from Aksum to Ankobar, but the close proximity of the warlike Gallas compelled King Constantine-Tsera to again transfer the capital northwards to Gondar. Constantine-Tsera was the first King of Abyssinia to adopt the title of Negus.

In the beginning of the fifteenth century happy days once more set in for Abyssinia. Authority, which had been shaken by internal disorders, became somewhat strengthened, so that the people could devote themselves to their occupations without being in momentary dread of the invasion of Mussulmán fanatics in the form of Arabs from the north and Gallas from the south. Accordingly, in the year 1429 A.D., the Negus Isaac made an attempt to establish relations with the rest of the Christian world. And so he despatched an embassy to France with an offer of alliance, for the purpose of eradicating Islám, and in order to show the possibility of carrying out such an intention he destroyed several of the neighbouring Mussulmán tribes. In France the idea was taken up seriously, and it was only the death of the enterprising Negus which interfered with the conclusion of an offensive alliance between France and Abyssinia.

Nearly a century afterwards the King of Portugal, John III., having casually heard of the existence of such a country as Abyssinia, sent thither, with religious and trading objects, a numerously composed and brilliant embassy. In the year 1525 A.D., the Negus Claudius-Atsnova-Sahet received this embassy in a specially cordial manner, and entered into negotiations with it. He, at the same time, sent an envoy to the Florentine Republic. Meanwhile the Catholic missionary, Bermudez, who had come with the King of Portugal's embassy, was soon consecrated *Abuna* of Abyssinia, a position which gives the holder the highest spiritual rank. The successor of Bermudez, indeed, became the spiritual head of Ethiopia, and as such was completely independent of

the Coptic Church. Had the work of subordinating Abyssinia to the Papal throne been continued gradually it would have been secured for all time. But unexpectedly, and with the object of diffusing the teaching of Islám, the Gallas raided into Abyssinia and carried fire and sword throughout the whole country, burning many of the towns, and amongst the number the ancient sacred city of Aksum.[1] Claudius fled, whereupon serious danger threatened the State. The last Christian sovereignty in Africa came near to complete overthrow, when 400 noble knight-errants of Portugal, under the leadership of Christopher Gama, son of the famous navigator, conceived it to be their duty to proceed to the assistance of the Abyssinian Christians. With the aid of some natives they inflicted a terrible defeat on the Gallas. The inspirited Abyssinians took up arms, and soon not a single foe remained in the country. Abyssinia thus once more preserved her independence, but her prosperity had received a decisive blow, and the influence of her sovereigns was finally shattered.

The Portuguese, as a thanksgiving offering for their aid, demanded various privileges and the complete subjection of the Abyssinian Church to the Pope of Rome. The Negus found that he could not oppose these demands, and so Jesuits flooded the country and began their usual intrigues; and although their first mission ended in the flight of its members, a second got the upper hand of the *Abuna* in 1603, when the Negus Fatselid and his family were compelled to embrace Catholicism. In 1624 the "King of Kings" triumphantly repudiated Monophysitism for himself and his people, and in order that Papism might be the more securely established, the Inquisition was instituted in Abyssinia. After the lapse of from eight to ten years Abyssinia was officially declared to have passed into the bosom of the Holy Catholic Faith; but, by degrees, the Abyssinian people, roused by the concessions of the Negus and by the severities of the Jesuits, rose in rebellion, whereupon complete anarchy took possession of the country. The greater portion of the Jesuits were slaughtered, and the rest fled out of the country. In 1641 the advent into Abyssinia of any Portuguese was finally forbidden. Although by the edict of the Negus Claudius a certain degree of religious tolerance was allowed, the ancient religion of the country was, at the same time, re-established.

The architectural relics of Portuguese residence in Abyssinia are now but few. The beautiful bridge across the Mahetch, without which communication between Gondar and the southern provinces of the country would be interrupted for five months in each year; the ruins of several churches and seminaries at Adowa; the small village on the Talba-Wakha, inhabited by descendants of the Portuguese, are now the sole remaining traces of Portuguese tyrannical rule over Abyssinia.

Ever since this unhappy country, harassed by external foes and torn by internal discord, has fallen lower and lower, until at length disintegration has shown itself with still greater persistence. With the weakening of the authority of the ruling Negus the influence of the several vassals has

[1] "The Sacred City of the Ethiopians, etc.," by Theodore Bent.

been in the ascendant, so that the Abyssinia of to-day appears as a house divided against itself, and religious uniformity is now the sole bond of union in the country. In the middle of the past century the Negus Josiah-Joas endeavoured to re-establish the ancient power of Abyssinia, but after his death the decay of the country set in with renewed force until, at last, in the beginning of the present century, when the Negus Gadtsege died, Abyssinia was split up into several small principalities which were always at enmity with each other, except in the face of danger from without. Thus, in the sixteenth century, besides the enfeebled Arabs, there appeared on the borders of Abyssinia Turkish Osmánli, who, having established themselves in Egypt, and in Arabia in 1557, seized Massowah and a portion of the Abyssinian coast-line. Since then the port of Massowah has passed from hand to hand, now of the Arabs, then of the English, Egyptians, and Italians, and so Abyssinia has been cut off from the sea and has been shut up in her own mountains, especially since the Arab principality of Harrar has become more firmly established to the south of Ethiopia. Since the 16th century Abyssinia has waged more than one war for the purpose of regaining possession of an exit to the open sea, and for the purpose of effecting this through the port of Massowah.

In the beginning of the present century, France made efforts to open up regular trading relations with Abyssinia, and for that purpose she, in 1839, sent two officers of the General Staff, Galinier and Ferre. These officers carried out many valuable scientific observations, but the direct object of their mission was not attained.

But soon there entered into the political arena a man, in the highest degree gifted, with a firm will but possessed of strong vices, which were, for a time, kept in check by the salutary influence of Europeans—a man who, however, knew how to re-unite the different portions of Abyssinia and who was destined to make the whole of Europe speak about him. This was the Negus Theodore. The history of this remarkable man is deserving of mention in a more detailed manner. He was born in the province of Kaura in 1818, and sprang from a good family. His original name was Lii-Cassa. His childhood was passed in the monastery of Debra-Jabner, where he devoted himself to the study of theology, and the history of his fatherland. He was deeply moved when he perceived the striking contrast between the greatness of the past and the pitiable present condition of his country. His stay in the monastery could not but afford him opportunity for reflection: a profound knowledge of the Holy Scriptures, a deep belief in his own destiny, and a no less intense hatred towards Islám, were the results of Theodore's stay in the monastery of Debra-Jabner. Whilst yet a youth he quitted the monastery, and through the high position of his uncle, the ruler of the provinces of Kaura, Dambea, and Chelga, he was appointed to a very prominent position in the Amhara Army. At that time Amhara was ruled over by the weak-minded Ras-Ali, but he was ruler only in name, since all power was in the hands of his mother, the proud and ambitious Minena. Possessed of a noble exterior and endowed with courage and

intelligence, the young Lii-Cassa rapidly advanced and speedily attracted the attention of the still middle-aged Queen Minena. Just about this time his uncle died, and he became ruler of the province of Kaura. But the young ruler, who was thirsting for a more active life, was not satisfied with his position and began to conspire against Ras-Ali. This weak-minded personage became frightened, and without bringing matters to a decisive encounter, as a mark of his attitude towards Cassa he gave him the hand of his young daughter Tuavitch in marriage. This first wife exercised an immense and a thoroughly beneficial influence over him by curbing the savage side of his character. Impelled by his hatred towards the Muhammadans, Lii-Cassa made ceaseless raids on the neighbouring Soudánese tribes—a course of action which enabled him to keep up a large army and to increase the number of his own adherents. His constant successes then led him into a campaign against Egypt, but at Goderafa he suffered a severe defeat and was badly wounded. Queen Minena, who well understood what a danger to the ruling dynasty lay in the ambitious Cassa, thought that the favourable moment had arrived for putting him out of the way, and so she made ready to war against him. Cassa having become aware of her preparations hastened to defend himself, and in 1848 he declared himself the independent ruler of Kaura. Queen Minena on several occasions sent her troops against him, but he always defeated them, and finally, in 1852, he assumed the offensive. After encountering the troops of Ras-Ali at Duyazilla, he scattered them and succeeded in capturing both the King and Queen. A succession of successful campaigns on the part of Cassa against the smaller Abyssinian princes culminated in an engagement before Derezgii, where he defeated and captured Ubie, the King of Tigrè (on the 10th February, 1855). This made Cassa the sole ruler of Abyssinia. Subsequently, under the name of Fadrusha or Theodore, he triumphantly assumed at Aksum the ancient crown of Abyssinia, and at the same time took the title of "Negus-Negusta," "King of Kings" or Emperor. The change in his name was called for by the circumstance that, according to an old prophecy much in vogue amongst the people, the power and glory of Abyssinia was to be restored by a sovereign whose name should be Theodore.

On ascending the throne, Theodore first of all adopted measures for the pacification of his dismembered country, and issued a proclamation in which he announced that "Everyone should return to the occupation of his forefathers, the casual soldier to his plough, the merchant to his bales, and so on." Every effort too was made to eradicate the freebooters who had devastated the country, and into the pursuit of these pests Theodore entered with peculiar severity. To this period[1] belongs the first bloody episode in the reign of Theodore. Putting faith in the words of the Negus's proclamation, the inhabitants of Tirza appeared before the Emperor, armed from head to foot, and asked for permission, in accordance with his order, to continue the calling of their fathers and grandfathers.

[1] According to Lejean.

"What sort of calling?" inquired the Negus.

"Of highwaymen and robbers," was the answer.

"Do you wish," said the Negus, restraining his anger with difficulty, "to become honest people? If so, I will give you some of my own territory and the necessary agricultural implements and horned cattle. But what then?"

"Never," was the reply; "our demands are in accordance with the Emperor's own proclamation."

"Is that your last word?" inquired Theodore.

"Yes," was the answer.

"Very well," said the Negus. "Return to your homes."

But the robbers never saw their homes again, for by Theodore's orders they were attacked on the way by soldiers, and several hundreds of them were shot down. With the remarkable persistence which distinguished this man of iron character, Theodore began to overhaul every department of the administration of his country. He turned his special attention towards lessening the decentralisation of power. He established tribunals, forbade slavery, organised a standing army, improved all the road communications, put all the industries on a proper footing, and for this purpose he introduced from Europe skilled craftsmen, and he lowered all customs dues, etc.

The German traveller Heiglin, who visited Abyssinia in 1861-62, gives the following description of the Negus, and of his working day:—"From early morning till late at night the Emperor is engaged in judicial and administrative business, and with military affairs, and the observance of religious ceremonies. Every detail of government is gone into by himself. Long before sunrise scores of petitioners are collected before the chain of sentinels which surround the Emperor's tent,[1] and call out 'Abet!' 'Abet!' or 'Dusan-lai' (Sovereign), hear us! The Negus then rises from his couch, hears the several requests and complaints, and straightway pronounces his punishments or his clemency. Then there begins a long reception of despatches and of messengers, and then the patrols bring forward the robbers and spies and other disturbers of law and order, who have been captured during the previous night. The carrying out of the sentences on these persons takes place on the spot without any very lengthy preliminaries. Theodore bears the character of being just, magnanimous, and generous, but withal extremely strict. By his iron hand alone can his people be ruled, for he knows their character well. The Negus dresses as simply as the rest of his countrymen. He either goes about barefooted, or wears wooden sandals. A splendid shot and horseman, he places himself at the head of his troops in every engagement. Europeans he respects, and he places a high value on their culture, knowledge, and inventive genius."

So writes a traveller who cannot be suspected of partiality, but who, at the same time, has forgotten to depict the bad side of the Negus's character, and yet the subject of his remarks was a man who was one born

[1] Theodore did not like town life, and during almost the whole of his reign he lived either in a tent or in a hastily constructed military camp.

for the time in which he lived, passionate, impulsive, often unduly severe, and always proud and self-opiniated.

The majority of the reforms introduced by Theodore were under the influence of two Europeans—the English Consul at Massowah, Plowden, and another Englishman of the name of Bell. These were two of his personal friends, men who were absolutely honest, and who were at the same time deeply devoted to him. Their salutary influence restrained the outbursts of the savage nature of the Negus, and directed and kept him to his good undertakings.

There set in a period, in fact, in which Abyssinia, peaceful within and undisturbed from without, could breathe freely. To this period (1855) relates—according to the French Consul at Massowah, Lejean—the despatch by the hands of some Russian tourist of the letter from Theodore to the Emperor Nicholas, in which he offered an alliance against Turkey and Egypt; but to this letter no answer was ever sent. And yet relations between Russia and Abyssinia had been entered into long before those of any of the maritime Powers. Soon after the fall of Byzantium, envoys of the Negus and monks of Abyssinia had more than once appeared at Moscow with letters from the Negus containing offers of every kind. But Russia was at that time far away from Abyssinia, even though that country looked towards her as the protectress of her ancient religion and as the defender of the Christianity which she had inherited from Byzantium.

Towards the end of 1855 an insurrection broke out in Tigrè and Hodjama, and although it was put down in its very inception, its leaders continued to hold out in the inaccessible gorges of Simen and Hodjama up to the year 1860. During this year, Theodore's cousin, Hared, one of the best knight-errants of the country, set up the standard of revolt. Theodore undertook a campaign against him. Plowden, who accompanied the Negus, becoming weary of this campaigning life, started off to visit an illustrious Abyssinian matron, with whom he desired to ally himself, but on the road Hared's adherents fell upon him and mortally wounded him. Theodore swore a terrible oath that he would be avenged for the death of his friend. Soon afterwards a detachment of Theodore's army encountered Hared's band of followers in the valley of the Cheber. Hared, spying through a beautiful telescope which had been the property of Plowden, saw the Negus riding at the head of his officers. He then threw the telescope to the ground with such force that it broke into small pieces, and with arms in his hands he galloped towards his enemy. Bell advanced with the object of covering the Negus with his own body, and with a shot from his rifle killed Hared, but he was at that very moment brought to the ground by Hared's brother, who was then killed by Theodore. After this short but bloody encounter the leaders of Hared's demoralised followers surrendered without further resistance, to the number of 1,700 men. Burning with revenge, the Negus ordered them to be taken to Debarek, and there to be beheaded and their bodies to be thrown aside without burial; and this was done. On the death of his two friends Theodore remained, so to speak, without moral tutelage. It was

about this time, too, that the wise and gentle Tuavitch died. She was the last true friend of the Negus, whose future mad character, having no longer any reins, began to show itself in all its innate strength. He then became suspicious, revengeful, and bloodthirsty. He took also to drink and debauchery, and, in a word, he became intractable.

At this period he had reached the zenith of his power. But everywhere there sets in a sharp turn to the evil-disposed. The numerical strength of his army and of his retainers' wives, and children had reached, according to the assurance of many eye-witnesses, the enormous figures of 400,000 souls. The maintenance of this unproductive mass of human beings devastated the country. The recent severity of the Negus had aroused general dissatisfaction, and thus the ground for his enemies was made ready. Rebellions broke out in every direction, and for the putting down of these towns and villages were reduced to ashes and victims were exterminated. Some entire provinces, as in the time of the old inroads of the Gallas, became depopulated and large tracts were no longer cultivated. With the falling away of the economic prosperity of the country and, as a consequence, the diminution of his resources and the numerical strength of his army, the support of Theodore's authority dwindled away and fell into disruption. Soon therefore, in order to maintain about his own person his immediate adherents, the Negus was obliged to pillage even those provinces which had remained faithful to him.

Meanwhile in England the death of Plowden had become known, and a new Consul, in the person of Captain Cameron, was sent out. Cameron received fully-detailed instructions not to interfere, as his predecessor had done, in the internal affairs of the country, and to occupy himself entirely with the study of the products of Abyssinia and with the establishment of trade relations with her. On the 7th October, 1862, the new Consul was received in state by the Negus, and in November of the same year he was sent off with a letter from Theodore to Queen Victoria. At the same time the Frenchman Bardel, who had been an accountant at Suez, went off with a similar letter to the Emperor Napoleon. In these letters Theodore proposed an alliance for the overthrow of Islám, and also asked for the despatch to himself of military instructors, mechanics, and craftsmen. For us, Russians, the circumstance is noteworthy that Theodore turned towards England and France with these proposals only after his attempt to draw to himself an alliance with Orthodox Russia had proved unsuccessful. Cameron fell sick on the way, and sent Theodore's letter on to Aden, whence it was despatched to England by post. To this letter no sort of importance was attached in England, and it was not even considered worth answering. In France they behaved towards the Negus with somewhat greater politeness, for Bardel returned with an answer, not indeed from the Emperor Napoleon himself, but from his Minister, M. Drouen de Louys.

Theodore was so enraged with such discourtesy towards himself that he placed the French Consul Lejean in chains, but he soon afterwards released him and ordered him to at once quit the country. Cameron

only escaped similar treatment by assuring the Negus that an answer from the Queen would soon arrive. From that time forward the Negus began to be badly disposed towards Europeans.

At this time Bardel reported to Theodore that Doctor Sterne, the head of the English Spiritual Mission, had, during his visit to Europe, published papers about Abyssinia in which he, the Emperor, was spoken of with extreme contumely, whilst his mother was called a vendor of *kousso* (a vegetable product used in cases of tape-worm and other intestinal parasites). This was the drop which caused the cup of the Negus's fury to overflow. Sterne and his colleagues were beaten and thrown into prison.

At the close of 1863, Captain Cameron, instead of the long-expected answer from Queen Victoria to Theodore's letter, received an order to at once rejoin his post at Massowah. Then the deeply-affronted Negus ordered Cameron also and the Europeans who were with him to be loaded with chains and to be cast into prison.

When in March, 1864, news reached England of the fate which had befallen Cameron and the missionaries, Theodore's letter at last received attention, and it was decided to send him an answer, signed by the Queen, through an envoy, who was to request him to free the captives. The Armenian Ormuzd Rassam, was selected as the envoy. He was a colleague of the English Resident at Aden, and a man who was well acquainted with the East. Rassam waited for a whole year at Massowah for the Negus's permission to proceed to the interior of Abyssinia, and at length, in January, 1866, he arrived, and together with his colleague, Lieutenant Prideaux, and the famous traveller Palgrave, presented himself before the Negus and handed to him the Queen's letter, and some very shabby presents. At first the Negus received this embassy very well and immediately ordered the release of the Europeans. But in the course of a few days a sharp change in Theodore's demeanour occurred, and all the Europeans, including the members of the embassy, were once more arrested and sent off to Magdála, where they were allowed to move about, but in chains. The cause of this fresh ill-treatment of the Europeans was, it was supposed, that Theodore expected an envoy of higher rank than Rassam and in the deputation of so unimportant an official he justly saw disrespect towards himself. Besides this, amongst the number of the gifts sent to him there was found a carpet, on which was depicted a hunting scene of the famous French sportsman Gerard, in pursuit of a lion. Now the lion is on the escutcheon of the Kings of Ethiopia. The suspicious Negus saw, in this circumstance, an allegory. In his opinion he himself was the lion and Gerard was meant to typify Egypt, the oppressor of Abyssinia. After lengthy debates in the British Parliament and endless discussions in the English newspapers, the British Government sent to Theodore, through the missionary Fleyd,[1] an ultimatum containing peremptory demands that he should send all the prisoners to

[1] Fleyd had been sent from Abyssinia with a fresh letter from the Negus in which he again asked that mechanics, craftsmen, machinery, and military instructors might be sent to him.

Massowah by the 17th August, 1866, and threatening him with an armed invasion of his country should he refuse to do so. This demand was not complied with, and so war with Abyssinia became unavoidable. A Special Commission was then formed under the leadership of Colonel Merewether for the investigation of the approaches to Abyssinia from the shores of the Red Sea. As we have already said in our geographical review, Abyssinia is separated from that sea by the waterless, sultry, and unhealthy desert of Samhara, wherein the heat usually reaches to 54° Réaumur in the shade. In its northern part, that is, in the neighbourhood of the gulf of Massowah, the above desert is scarcely wider than 50 kilometres, but it gradually widens towards the south in the parallel of Tajurah, where it reaches to 350 kilometres in breadth. The southern ports of Tajurah, Assab (in the Straits of Bab-el-Mandeb), and Edd (on the Red Sea) were, therefore, held to be impracticable as places for the debarkation of troops. There remained then for consideration, Massowah, Annesley Bay (Adula), and Hanfilla (the ancient Antifillus). But at Massowah there was an Egyptian garrison,[1] and a joint occupation of this port might lead to serious misunderstandings. Although Hanfilla possesses an excellent anchorage, the desert littoral at this place is considerably wider than elsewhere. The Commission therefore decided on the selection of Annesley Bay. Towards the end of October, 1867, the advanced part of the British force disembarked at Zoulla, and there on the shore, immediately facing the Abyssinian mountains, was established the British depôt, whence a line of railway was carried to the very foot of the plateau.

The whole of the expedition of 1867-68 presents a brilliant page in the military history of Europe, one indeed not remarkable for any unusual exploits of the troops or of individual persons, but for a rare display of foresight and capable organisation, especially in the leadership of the whole campaign. The British had not, properly speaking, to war with peoples, but to combat at every step with nature, and with the unfavourable natural conditions of the country through which they had to pass. The western part of Annesley Bay is very shallow, and this necessitated the construction of a mole. There was no supply of fresh water, so condensing machines had to be set up. Forage and provisions were not procurable at any of the adjacent ports, and everything in this shape had to be brought from either India or Europe. No roadways existed to the Abyssinian table-land, and these had therefore to be constructed with the greatest amount of labour. The severe heat and the increasing fatigue which the troops had to undergo caused sickness to be rife, and this necessitated the construction of numerous hospitals and camp lazarettos. In a word, the British had, at every step, to contend against obstacles of every kind; but knowledge, skill, a vast display of labour, and enormous expenditure of money enabled them to surmount every impediment. The Expeditionary Force consisted of 4,000 British and 8,000 native troops, with 24 guns, 2 mortars, and 16 rocket stands. The

[1] Between 1557 and 1865, Massowah and Suakim belonged to Turkey, but in the latter year they were sold with the co-operation of England to Egypt.

commander of this body of men was General Sir Robert Napier, who had distinguished himself in the Chinese War of 1860. The armament of the British troops consisted of Snider breech-loaders, that of the native troops was the old muzzle-loading rifle. Besides the 12,000 combatants, there were with the force 14,000 non-combatants. The pack transport reached the portentous total of 40,000 animals, including 45 elephants, which were chiefly used for the transport of the artillery over the mountain tracks.

By the 5th December, 1867, Colonel Merewether had reached the Abyssinian frontier with a small body of men and had occupied Senafe. At this time Theodore, whose possessions were now limited to the confines of his camp and to a few forts, moved from the monastery of Debra-Tabor to the inaccessible fortress of Magdála, lying on the highlands of the Beshilo river, and here he decided to give battle to the advancing British force.

The British troops, after constructing a road and establishing various fortified posts, gradually moved forward to the above objective. Throughout the whole extent of country from Zoulla to the uplands of the Beshilo river the British met with not the slightest opposition, notwithstanding that on their line of operations there were the rulers of Tigrè, Kasai, and Lasta and the Gobazi, who together could dispose of 100,000 fighting-men, a force which would have constituted for any defeated British troops a serious danger. But the natives of the country met the British not as foes, but as deliverers, and as people who had come to put an end to the barbarities and to the arbitrary deeds of a blood-stained tyrant such as Theodore had of late become. Indeed, they aided the British in every possible way, supplying them with provisions, forage, and both pack and slaughter animals.

On the 10th April, 1868, the British crossed the Beshilo river and ascended the plateau of Arraga, in the neighbourhood of Magdála. Here occurred the first encounter with Theodore's troops, who suffered a terrible defeat.[1]

After long conferences and the display of much vacillation, the Negus, in obedience to the demands of Sir Robert Napier, released all the Europeans whom he had imprisoned, but declined to surrender his own person. He at the same time executed 300 political offenders, whom he had incarcerated at this time within the fortress of Magdála. He did so by hurling them from the top of the lofty crag. The imprisoned Europeans barely escaped the same fate.

Having lost all hope of inflicting a defeat on his enemy, during the night of the 13th April the Negus released all his troops from their oath

[1] According to official information the British lost in this engagement one soldier killed and one officer and 11 rank and file wounded. Whereas the Abyssinians lost 800 men in killed and 1,500 in wounded. The information as to the Abyssinian losses was evidently exaggerated. The British fired 18,000 rifle cartridges, and the number of hits being recorded as 2,300, or 13 per cent., the supposed Abyssinian losses would therefore be much above the usual experience of war.

of allegiance and dismissed them, and he himself, attended by four of his leading men and by a few devoted soldiers, made an attempt to escape towards the south; but in that direction the Gallas were keeping a strict watch, and he was compelled to turn back. In the early morning the British advanced to the storming of Magdála. The Negus with his dozen or so of adherents could not of course offer any sort of serious opposition, and so Magdála was captured. But the proud Theodore did not surrender himself to his enemy, preferring to blow his brains out with a pistol shot.

Thus terminated the life of a capable and energetic ruler, who, under other circumstances, might have called Abyssinia to new life and have led her into the circle of civilised nations. This was indeed the dream of his life.

Whilst giving every just meed of praise to the surprising display of exemplary organisation which attended the British expedition, it cannot but be said that the causes of its easy and brilliant successes are to be exclusively accounted for in the absence of any wish on the part of the Abyssinians to offer resistance. The British, in fact, did for the Negus only that which his people were desirous of doing for themselves. The example of the Italians, equipped with the improved resources which modern military science now offers, and yet unable to successfully contend against even a small body of Abyssinian troops or to advance a single step out of Massowah, shows that a struggle with the Abyssinia of to-day is not an easy matter even for a European army.

Thanks to Sir Robert Napier's brilliant expedition the Europeans had been released, the honour of England had been re-established, and she had once more shown to the world that she knows how to make her name "honoured and feared as of old." After attaining their object the British completely evacuated Abyssinia without interfering in any way in the internal affairs of the country. Kasai, the ruler of Tigrè, who had rendered them special services, was liberally loaded with gifts, which principally consisted of arms.

On the departure of the English, a troublous time again set in in Abyssinia. As pretenders to the ancient crown of Menelek, three persons came forward: Menelek, ruler of Shoa; Gobazi, the petty ruler of Lasta; and Kasai, ruler of Tigrè. The last-named got the upper hand, and he, in 1870, ascended the throne of Abyssinia, under the title of John IV. He reigned prosperously, thanks to his tact and diplomatic skill.

The first years of the reign of Negus John passed in his efforts to pacify the country, which had been agitated and wasted by recent events. But in the year 1872, disputes arose between Egypt and Abyssinia, on account of the border provinces.

Egypt just at that time exalted by the famous Mehemet-Ali, proud of his successes and conquests, was in the highest grade of her prosperity, a condition which called to remembrance, as to external appearances, the brilliant times of the Pharaohs. The Khedive of Egypt, having just conquered the Soudán, had become one of the powerful rulers of the

world, in regard to the size of his African possessions, territory which stretched from the Sahara up to Palestine in Arabia proper, and from the mouths of the Nile as far as the countries of the great lakes and the sources of the Congo. Egyptian garrisons occupied the ports of Arabia proper, and of the Abyssinian coast-line. Harrar itself and Somaliland had been incorporated in the possessions of Egypt, which surrounded, in fact, little Abyssinia on every side. Indeed, it seemed as though Egypt was ready to engulf the ancient Ethiopia.

Weakened as she was by internal disorders, it appeared that Abyssinia was not in a position to maintain a struggle against flourishing and powerful Egypt. Indeed, Negus John had turned in vain with a request for aid towards England and France. To the same period (1874) relates, too, another unsuccessful attempt on the part of Abyssinia to enter into close relations with Russia. But the apprehensions of John were groundless, and, left entirely to herself, Abyssinia issued with honours out of the struggle. At the close of the year 1875 a body consisting of 30,000 excellently-equipped regular Egyptian troops, armed with Remington rifles and furnished with a large complement of artillery, advanced from Kassala along the banks of the Mareb river on Aksum, the ancient capital of Ethiopia. In the neighbourhood of the small hamlet of Gundet the Abyssinians, armed almost entirely with weapons of cold steel, fell upon them, and in the course of a bloody fight, which lasted for three days, destroyed the entire Egyptian force, capturing the 30,000 Remington rifles and 100 guns. Arakel Bey and Arendruk, the two commanders of the Egyptian army, perished, together with thousands of their soldiers. To this day the bones of the Egyptian soldiery lie whitening amidst the herbage of the hamlet of Gundet. In 1876 there came to Abyssinia a second Egyptian army, for the purpose of avenging the disastrous operations of the previous campaign. This army was under the leadership of Prince Hassan, son of the Khedive Ismail. Having gained possession of the plateau of Hamassen, the Egyptians fortified themselves on the inaccessible position of Gura. There the Abyssinians fell upon them, and after a desperate fight they once more almost entirely destroyed a whole Egyptian army corps, again capturing the whole of its artillery and a large number of rifles. The Egyptian Pashas were taken prisoners, and it is said that the triumphant Abyssinians made on the hands of some of them the sign of the Cross. Thus, an Egyptian campaign, which had threatened to make of Abyssinia a Mussulmán satrapy, terminated in the complete victory of the Christians. With the same bravery, too, did the Danakili fight against the Egyptians for their independence. This tribe had always at critical moments espoused the cause of Abyssinia. Thus, in 1840, they destroyed a body of Arabs which had advanced from Zeila towards Aussa, and it was, too, under the spears of the Danakili that the Pasha Muntsinger, with a body of Egyptian soldiers, fell in 1875, when they thought that they could traverse the desert of Samhara to the mountains of Shoa.

Soon after the catastrophe of Gura, the Abyssinians began to dictate to Egypt their own terms; they began by demanding the rendition of

the Soudán and Nubia and the payment of an indemnity of £2,000,000. Subsequently they confined their demands to the money contribution only, and until payment of this was made they kept the Egyptian Pashas as hostages. It was, therefore, on the fields of Gundet and of Gura that the bright star of the recently exalted Egypt began first to wane. Subsequent military failures and terrible waste of the country's finances, coupled with insurrections and the exactions of Europeans, soon reduced Egypt to beggary and brought the country of the Pharaohs into the hands of English creditors.

In 1876 Abyssinia made a third attempt in the course of the present century to enter into brotherly relations with Russia, but this attempt was likewise a failure. Russia was then preparing for another war with Turkey and far-off Abyssinia interested no one.[1] Four years after the Russo-Turkish War of 1877, one of the highest personages in Abyssinia, through the medium of an Oriental professor, again turned towards our Government with a similar request. In this letter, amongst other matters, mention was made that Abyssinia wished for a Metropolitan, on whom hands had been laid by the Most Holy Synod. In other words, an offer was made to unite the Abyssinian Church with our own. This letter was forwarded to the Ministry for Foreign Affairs, whence an answer was returned that this Ministry would hold no kind of relations with Abyssinia and knew nothing about her. It is true that our Diplomatic Department had had no dealings with Abyssinia, but twenty-five years earlier the Most Holy Cyril and Porphyry (famous explorers of holy places in the East) had raised the question of equipping a Russian mission to Abyssinia.

When, therefore, Russia paid no attention to the hand stretched out to her from the Red Sea littoral, Western Europe endeavoured, and is still endeavouring, to seize there everything which it is possible to get, at whatever cost.

With the piercing of the Suez Canal, the Red Sea and the countries thereto adjacent have again acquired the same degree of importance as they had before the adoption of the maritime route to India round the Cape of Good Hope, since through the Suez Canal and the Red Sea runs the main artery of the trade relations of the Colonial Powers of the West.

In order to appreciate the transcendent importance of this route as regards the trade of the Colonial Powers of Europe, we must dwell upon a characteristic feature of the development of this trade, and we must lay special stress on England, and on the conclusions which we shall arrive at with regard to her, whilst we refer, in a less marked way, to other Western Powers as well.

Contemporary England derives her power from the vast trade which is developed by her industries and from the sap of her numerous rich colonies. But these sources of her power constitute also her "Achilles' heel." The manufacturing activity of England has not developed in

[1] See *Russki Vaistnik* (*Russian Messenger*) of 1884, and an article headed "What is Abyssinia and what do the Italians desire of her?"

proportion to the quantity of the raw products which are obtainable in the country itself, for that activity depends on the shipment of raw products from abroad and on the export of manufactured goods out of that raw produce so obtained. If it once became possible to arrest this transport of raw produce, and so to check the export of manufactured goods, then the mercantile and manufacturing industries of England would be so reduced that $\frac{9}{10}$ths of her population would be without work, and therefore without bread, and then this now powerful State would be brought within the range of such heavy economic crimes and such colossal popular disturbances as, we make bold to say, Europe will have never seen the like.

England fully understands[1] the thorough danger of her position, and though she has not the power to cut the evil at its very root, she adopts various palliatives in her anxiety to place the well-being of her rapidly-increasing population and the prosperity of her industries as far as possible outside the pale of all contingencies. With this object she is ever on the look-out to acquire as large a number as possible of safe coaling-stations along the routes usually adopted by her mercantile vessels, and to fortify these and to store them with supplies of coal. With such an object she has of late devoted serious attention to seizing the Suez Canal and the prolongation of that water-way, the Red Sea. It is needless to speak of the importance which these two navigable routes have for England. In fact, the Suez Canal and the Red Sea might have a decisive importance in the event of England coming into collision with any Power that had succeeded in establishing itself in either of these two waters. If the Canal, for instance, were not at all times open to her, England would, in case of war, be placed at a military disadvantage, as she would be deprived of the possibility of using the shortest navigable route; and her mercantile navy would then be obliged to adopt the circuitous and dangerous route round Africa, whereon the naval stations belonging to England lie at huge distances apart, and throughout the whole of which privateers might freely cruise (for the employment of such vessels has not been finally got rid of), to say nothing of an enemy's heavily armed and swift war-vessels.[2]

Although England possesses a most powerful war fleet,[3] this constitutes her sole material strength, and on it would be placed too many duties in the shape of conducting hostile operations and guarding colonies, so that to take upon itself the convoy of merchant-steamers and sailing-ships would be simply out of the question. Exposed then as it would be to momentary attacks, the mercantile fleet of England would either become largely reduced or confined to its own waters. And either

[1] Query, does she?—W. E. G.

[2] During the American Civil War the "Alabama" showed what might be done by a single cruiser having an energetic captain and a capable crew.

[3] But even this idea is now open to doubt in the face of the rapid development of the American and French, and even the German, fleets; for *in a proportionate sense* these may be said to even now threaten the supremacy of the English fleet, which in the eyes of the English themselves is losing some of its former glamour.

alternative would suffice to deprive the long-proud Britons of all possibility of maintaining an active foreign policy.

The importance, then, which in all its comprehensiveness the Red Sea, with its littoral, has for England applies also in a greater or lesser degree to the other Colonial Powers of Western Europe. It is manifest, therefore, why, by hook or by crook, Europeans are using every endeavour to establish themselves on these shores.[1]

The English occupy Aden, Ceylon, and Perim, which really commands the Straits of Bab-el-Mandeb (whilst Aden does not), and they have established their influence over Egypt. In 1862 the French bought of the Danakili, for the sum of 10,000 *thalers*, Sahalo and Obok, in the Gulf of Tajura, and by the year 1880 they had become possessed of almost the whole of the Gulf of Tajura. They are now endeavouring, but hitherto without success, to occupy the island of Dessi, which is close to Massowah. At the present time more than 3,000 square *kilomètres* of territory belong to the French in the neighbourhood of the shores of the Gulf of Tajura. One French traveller has even succeeded in obtaining from King Menelek a concession for a railway from Obok to Ankobar.[2] And in 1880 the Spaniards tried to get possession of Annesley Bay, but their one effort to

[1] I will here adduce a characteristic example of English dexterity and unscrupulousness. The East India Company of pious memory were in need of a coaling station. At that time the strategical importance of Aden as commanding the Straits of Bab-el-Mandeb had just become apparent, and so practical navigators determined to get possession of such a point, at whatever cost. At first they thought of taking it by force, but then the possibility of a collision with Turkey induced them to resort to a more dexterous method. A large vessel named the "Daria-Daulet," sailing under the British flag, was designedly sunk by the English off the Aden coast. The Arabs of course plundered the vessel, murdered the greater part of the crew and carried off the women who were on board. The British Government sent Captain Keen to Aden with demands for satisfaction for the insult offered to the British flag, and for an indemnity for the loss thereby occasioned. Captain Keen was directed to at first threaten the Sultán of Aden, and then to try and induce him to sell the port. The Sultán agreed to pay the cost of the sunken vessel, and Captain Keen, having very prudently received the money, proceeded to negotiate for the purchase of Aden, and the lands adjacent to it. The Sultán was not disinclined to sell the port in return for the money which Captain Keen had already received for the sunken ship, plus 12,500 rupees as compensation for the loss of shipping dues. In this sense, an act of transfer was accordingly prepared. But here occurred something which was not a little extraordinary. Captain Keen's interpreter stole the Sultán's seal used here as elsewhere throughout the East in place of a signature, and an impression thereof was affixed to the deed, which thus acquired a lawful force, notwithstanding the fact that not a shilling was ever paid. The brave captain, with the completed deed in his pocket and the money also, then hastened to leave Aden without even waiting for a farewell audience with the Sultán. But at that time one of the pashas, subject to Mahomet-Ali, began to threaten Aden. England then offered the Sultán her assistance, an offer which he readily accepted, and the town was immediately occupied by a British garrison. Thus *de facto* and *de jure* Aden became British without any special outlay. Needless to add that the owner of the sunken ship received no sort of remuneration.

[2] See my translation headed "Obok and the Country bordering on the Gulf of Tajura" in the JOURNAL of May, 1897.—W. E. G.

secure a footing in this part of the world called forth a perfect storm in the columns of the English Press, and so it was abandoned. The Italians alone, with the co-operation of England, with whom they have entered into an agreement, have established themselves throughout the whole of the western coast-line of the Red Sea from Massowah on the north to the Sultanate of Rakheit on the south.

The Italians, too, long ago entered upon an active colonial policy on the shores of the Red Sea, for in the seventies the Steam Navigation Company "Rubattino" leased of the natives for a period of ten years a strip of coast-line near to Assab, in order to build there trading factories. And in 1880 the same company acquired this slice of territory in perpetuity. In 1882 it was declared to be an Italian colony, and every endeavour was made therefrom to establish regular trading relations with the towns of Shoa. The distance, however, from Assab to Ankobar involves a journey of about 35 days, and that circumstance impedes any active trade relations. If we add to the French station of Obok and to the Italian colony of Assab the English port of Zeila, then we shall see that three Abyssinian ports which might have served as windows overlooking the ocean for *Habesh* now belong to various nations of Europe.[1] But Abyssinia does not desire to take advantage of all these exits at the hands of a foreigner, but is rather endeavouring to reconquer the nearer to hand and more advantageously situated port of Massowah, which has been occupied by the Italians.

In the beginning of the year 1885, England, apprehensive of the uprising of a powerful native State on the shores of the Red Sea, such as Abyssinia might prove to be, made a way for herself in that direction, and in the desire to gain others in the struggle with the Soudán Dervishes, proposed to Italy that she should occupy the port of Massowah with the adjacent coast-line. Of course, she did not wish to allow another powerful State and one more interested in the fate of this route to get a hold in that direction, and indeed she only permitted Italy to do so as a factor in any political combination that might enable her to acquire, without any expenditure or special endeavours, fresh colonies that would otherwise call for the flow of still more blood and treasure.

In order to present a still clearer picture of the later events in the present struggle between Abyssinia and Italy, we must go back somewhat in the history of the relations of these two countries. As we all know, in the year 1882 England appeared in Egypt in the *rôle* of the introducer of order, and as the ally of the Khedive, or rather of his supporter, in the face of the burdensome political and economic conditions that had befallen his unhappy country. The appearance of the English, however, not only did not tend to pacify the country, but it brought it to a still worse state of disorder, for soon after the insurrection of Arabi-Pasha had been quelled, there arose the Mahdi as the new prophet of Islám, and he succeeded in wresting from the civilised world

[1] See note to my translation headed "Abyssinia: a brief sketch of its Geography and History" in the JOURNAL of May, 1896.—W. E. G.

the whole of the Egyptian Soudán, a province which in area is nearly equal to the fourth part of Europe. The pace and energy of the English then somewhat slackened. It is difficult to determine whether this was so, because the task of contending with the gradually extending burning religious fanaticism of the Dervishes seemed to England to be beyond her powers, or whether she did not consider it to her interest to too rapidly quench the torch of insurrection. But however this may be, she acted in an extremely vacillating manner, and what she did brought about no positive results. In all probability England perceived that to grapple with the Mahdi was not so easy an affair as to contend against Negus Theodore and the Khedive of Egypt, and therefore she began to withdraw the Egyptian garrisons from the scattered forts in the provinces which had been overtaken by the rebellion. Some of these forts, especially those on the borders of Abyssinia, were, however, so removed from the advanced English and Egyptian posts, that their defenders could not of course cut their way through the hordes under the banners of the Mahdi, and these were doomed to destruction. The British Government then turned to Ras-Azula, the detester of the Soudánese, and the almost entirely independent Viceroy of the province of Tigrè, with a request that he would relieve the besieged garrisons, and especially that of Kassala, in which there were some English as well as Egyptians. Ras-Azula, who was ready on his own account to enter into a struggle with the Mahdists, acceded to the request made, but demanded as a reward for so doing 15,000 Remington rifles, 10,000,000 cartridges, and a payment of one million francs. He also demanded the port of Massowah, which still nominally belonged to Egypt. As we have seen, from what has been already said, the entire importance of Massowah lies in this, that by it passes the chief caravan route into Abyssinia, and here also the waterless, sultry and unhealthy littoral has no greater breadth than from 40 to 50 *versts* ($26\frac{2}{3}$ to $33\frac{1}{3}$ miles).

The presentation on the part of Ras-Azula of a demand for the port of Massowah was a clear intimation that in Abyssinia they had thoroughly awoke to a complete perception of the thorough indispensableness of "a window and of a door into Europe." This awakening has a great signification. Indeed it may be said to herald the beginning of a new era in the political life of Abyssinia. Abyssinia, in fact, by seeking an exit towards the sea, has already become the competitor of England and of the other Colonial Powers of Europe who were endeavouring to establish themselves on the shores of the Red Sea. The interests of Abyssinia, supported by 100,000 rifles, would henceforth become interwoven with those of several of the European Powers. Thus, after many centuries of somnolence, Abyssinia will enter once more into the general channel of international life in the character of one of its prominent factors.

To all of Ras-Azula's demands the English assented, and he was immediately furnished with all that he had asked for in the way of arms, cartridges, and money. Accordingly, at the close of 1884, Ras-Azula at the head of a large army advanced against the Soudánese. After freeing

several forts from the Mahdists who were besieging them, and after despatching the garrisons with their families to Egypt *viâ* Massowah, Ras-Azula came at length to Kassala, but this place proved to have been already taken and its garrison had been massacred. After utterly defeating the Soudánese in a great battle, in which he took from them many breech-loading rifles, and after accomplishing all that he had undertaken with the English to do, Ras-Azula then set out for Massowah, but as he was still on the road he learnt that the practical English had found it to be more advantageous in respect of the fulfilment of their part of the agreement not to carry out the surrender of Massowah. One may picture to one's-self the sort of sympathy which the Abyssinians now nourish towards both England and Italy!

Massowah was at this time (5th January, 1885) occupied by a small Italian detachment, under the command of Colonel Saletta. The commander of the Egyptian garrison, which was there before the above date, protested, and the protest was forwarded to the Sublime Porte, but the subject at issue only led to a lengthened exchange of notes. By December 1885, not a single Egyptian soldier remained at Massowah, and the Egyptian standard, which up to this time had been flying beside that of the Italian, altogether disappeared.

In the summer too of the same year the Italian frigate "Esploratoré" took possession of the entire littoral from the peninsula of Buri up to Cape Darma, and by an official notification of the Italian Minister for Foreign Affairs, Count Robillant, it was announced that Italy had extended her sphere of influence on the Red Sea coast so as to cover an area of from 10 to 30 *kilomètres* in breadth and to 500 *kilomètres* in length.

Of course, Abyssinia could not remain indifferent to such a state of things, which really placed her in a state of economic dependence on Italy, and would in the future even threaten her real existence. In these days every country which enters into relations with civilised peoples, if it does not adapt itself to the general course of cultured existence, and does not strive to be on a level with the demands of the age in which it lives, loses its independence and becomes subject to its more civilised neighbours who stand, as it were, on a higher pinnacle of cultured development. The very safety of a people, which wishes to retain an independent existence amidst the civilisation which surrounds it, must cause it to adopt the path of free intercourse with more enlightened nations. In the present state of affairs, Abyssinia is cut off from the rest of the world. To the south, as we have already said, there stretch countries occupying a lower grade of development than that which she herself occupies. To the north and to the west lies Egypt, formerly contiguous to her, but now separated by a wave of insurrectionary Soudánese. There remains her Eastern boundary, but there, along the Red Sea coast, the Italians have established themselves, and the problem which they have set themselves is not to raise the intellectual life of the Abyssinians, but to take every possible advantage of the geographical position so gained to exploit the natural riches of the territories of the Negus. But in Abyssinia the knowledge has declared itself that it is

necessary to push through towards the rest of the world, and to a freer atmosphere. Hence from behind Massowah, Madre, Edda, Assab, and from behind these "windows overlooking Europe," there has begun, after an entire series of diplomatic ruptures and collisions, an armed struggle between the Kingdom of Italy and the Kingdom of Ethiopia.

On the 25th January, 1887, Ras-Azula, in the capacity of an army leader of the Negus John, and at the head of a force of 5,000 Abyssinians, attacked Saati, the advanced post of the Italian forces occupying Massowah. This attack was repulsed. At the request of the commander of the Italian post, who expected a second attack, reinforcements were sent out from Massowah consisting (according to an official account) of three companies of infantry, and several machine guns with their crews, representing a total of 500 rank and file, and 24 officers.[1] When half way out of Massowah this body came upon the Abyssinians, and at once began to retire, with the object, it was said, of taking up a suitable position behind some rising ground; but when the Italians had occupied this, the Abyssinian troops surrounded them as with an iron band. The Italians soon shot away all their ammunition, and their machine guns got jammed, and then, after a three hours' fight, 78 rank and file and one officer of the Italian force were taken prisoners by the Abyssinians and the rest were amongst the slain.

Then, in order to restore the honour of their arms and also their prestige, which had fallen greatly in the eyes of the natives, the Italian Government decided upon a large expedition, which was intended to lay waste bold Abyssinia. Accordingly in the autumn of the same year (1887) a force of 18,000 selected Italian troops were despatched to Africa. It was evidently intended by the employment of so large a force not only to punish Abyssinia but to complete its subjugation. Moreover, with an amusing display of haste, it was thought to introduce Roman Catholicism into the country, and for this purpose as many as 50 missionary fathers accompanied the Italian army of invasion! In view of these obviously threatening preparations Abyssinia did not remain inactive. Three armies of the Negus, of a total strength of 70,000 men, armed with breech-loading rifles, were moved towards the joint frontier. A synod, which sat in session at the Monastery of Debra-Tabor, placed under a curse any one who should enter into relations with the enemies of the fatherland. The war thus became a popular war, and Negus John himself took the field. Even Menelek, King of Shoa, who had always shown sympathy towards the Italians and towards Roman Catholicism, dared not act against the general movement, and so he placed at the disposal of the Negus a body consisting of 8,000 men, excellently equipped by means of Italian money which he had received. The independent leader Debet, chief of the Bashi-Bazuks, who had been organised by the Italians out of the Abyssinian peoples dwelling on the frontier, followed Menelek's example. But all these warlike preparations

[1] Other unofficial sources of information gave the strength of the column as 2,000 altogether.

proved to be premature, because the Italian troops, under the command of General San Martsano, and the missionary fathers which were with them, sat quietly inside Massowah, and under the protection of their own guns died off through the ravages of dysentery!

An entire epoch passed away in this unintelligible and, from a military point of view, shameful inactivity, and with it came to an end all possibility of conducting military operations within the limits of Abyssinian territory. In the spring of the following year, in view of the setting in of the summer heats, considerable reinforcements arrived for the Italian forces from the fatherland, and yet there were only inconsiderable garrisons on African soil.

Still their inaction afforded no evidence that the Italians had completely abandoned the thought of retaliation and of fresh seizure of Abyssinian territory. On the contrary, it may be said that such inactivity was only proof of the existence of doubts on the part of the Italians of the possibility of attaining their object with the comparatively insufficient resources at the disposal of General San Martsano, at Massowah. These doubts were, indeed, fully justified. The Italians could not reckon on another such easy victory as had been gained by the English in the Anglo-Abyssinian Campaign of 1867-68; since the English in that campaign had not waged war with the Abyssinian nation, but only with the Negus Theodore, who had incurred the hatred of his own subjects. Moreover, the English had not then attempted to interfere with the freedom of the country or with its welfare. Their sole desire was to put an end to the frenzies of a man who thought he was acting aright. In doing this they merely carried out what the people themselves were prepared to do. Herein, therefore, lay the explanation of the fact that the English did not encounter the very slightest opposition up to the very ascent to the Arraga plateau, which lay at a distance of more than 600 *kilomètres* from the place of the debarkation of their troops. And herein alone is the explanation to be found as to why the rulers of Tigrè and of Lasta, who together could have opposed them with 100,000 men, not merely did not threaten the English Expeditionary Force of 12,000 men, but even assisted it and supplied it with all which it required. If, therefore, England had attained so easily the object which she had in view, the causes of this fact lay exclusively in the absence of all desire on the part of the mass of the Abyssinian people to oppose her. But Italy could not count on any similar conditions. By encroaching on the welfare and the independence of Abyssinia she had roused the hatred of the entire population, every warrior of which, to say nothing of every male, would be ready to offer her the most determined resistance. If, therefore, Italy should forget the examples of the past, she would be compelled to face a state of things not, indeed, especially comforting for her, but one which more closely resembled her present position. This similarity was to be found in the ill-fated campaign of the Egyptians in 1875, when the Abyssinians, then armed almost entirely with weapons of cold steel, destroyed a force composed of 30,000 men armed with Remington rifles. Moreover, since that period many waters had flowed

and Abyssinia had not spent the time in vain. Now her troops are armed with breech-loading rifles, of which there are more than 100,000 in the country. As to comparisons with European organisations and to the equipment of armies under the leadership to a great extent, at least, of Europeans, the Abyssinians, as they awaited the Italian advance, had no anxiety whatever.

It may be said that Nature herself has rendered Abyssinia capable of conducting indefinitely a defensive warfare. The whole country[1] consists of elevated mountain plateaux (*ambas*),[2] which are abundantly supplied with water, and which are covered with gardens, luxuriant pasture lands, and cultivated fields, which yield two harvests in the year. Such natural fortresses (that of Gunib, for example) are separated from each other by deep gorges and river beds, along which giddy precipices afford the sole method of communication. In many places access to the summits of these *ambas* is possible only with the aid of scaling ladders. It is true that there are fairly good footways between the capital of the petty sovereignty of Gondar and Massowah and from both these points to Magdála, but these wretched tracks are not practicable for either wheeled transport or for field artillery. The conduct then of offensive warfare in such a country is evidently not an easy undertaking. Nor was General San Martsano's army corps equal to the task.

Properly speaking, there are at the disposal of Italy only two methods of waging war against Abyssinia. The first of these consists in sending two bodies of troops into the country, one behind the other, and so dividing the Italian forces, as the English in fact did theirs. But in this case the absence of roads suitable for wheeled transport would compel the Italians to have a proper amount of pack animals. And for these they would have to carry the necessary forage with them, since the people of the country would lose no time in burning all the local supplies rather than leave anything to fall into the hands of the hated invaders. In the face of such conditions, pack transport would have to be furnished on a colossal scale, and being necessarily scattered over a large area the greater part of an army of invasion would be employed, not in mere fighting, but in guarding its own pack animals.[3] Even if we allow that

[1] See note at foot of page 3 of my translation headed "Abyssinia: a brief sketch of its Geography and History" in the JOURNAL of May, 1896.—W. E. G.

[2] See note to my translation headed "Abyssinia: a brief sketch of its Geography and History."—W. E. G.

[3] In 1868, the English employed for an army of 12,000 combatants, 14,000 non-combatants, and of these only 3,000 reached Magdála for the infliction of the decisive blow. The remainder were occupied at the several fortified depôts, or were employed on the lines of communication. This too was at a time when these lines of communication ran, as we have already explained, through a country occupied by a population that was distinctly friendly. The Italians could not count on like conditions. Consequently in their case the disproportion of operating troops to non-combatants would be immense, and would be distinctly unfavourable. Even if we adhere to the proportionate figures to be found in Sir Robert Napier's Expedition, we shall find that in order to dispose of 25,000 free troops for service in the field, Italy must send for the invasion of Abyssinia not 18,000 but 100,000 soldiers.

the Italians might succeed in defeating one Abyssinian army (but it is not easy to say so, looking to the sorry fate which has overtaken more than one Egyptian Expedition), they would, whilst scattered over the country, be at once confronted with another that would be ready for a fresh contest. The Abyssinian organisation cannot be broken, for, properly speaking, it cannot be said to exist. In its place we find the existence of a love of war, general cheeriness, and a universal hatred for an enemy, everything in fact which tends to ensure the success of a guerilla style of warfare. The brief period (the summer months) in which alone it is possible to conduct military operations in Abyssinia, cannot be considered but as an unfavourable condition, for it is evident that within the compass of such a limited season no decisive results could be attained.

The other method of warfare open to the Italians would seem to be incomparably more sure. This consists in the adaptation of the principles which we Russians worked out in the subjugation of the Caucasus. The invading troops would then have to gradually occupy the country, keeping to the natural limits as defined by the several mountain ranges, each of which would have to be crowned with fortified positions. After fortifying in turn every zone so defined, and connecting the whole line of communication by means of bridges, roads, and supply stores, another line of operations would then be entered upon and completed in like manner.[1] But this method would entail a lengthened strain on an army's resources, and for such a method the resources of Italy are not at all adapted. The task of trying to carry out such a system of warfare would weaken her position in Europe, where she is already confronted with very formidable undertakings, and where she, in her desire to play the part of a great Power, might bring upon herself certain obligations that would demand, in the perhaps not distant future, all her superfluous energy.

Be this, however, as it may, Italy, judging by what we read in the newspapers, is actively preparing for a fresh Abyssinian expedition on a large scale. But we think, without giving ourselves credit for the gift of prophecy, it may be foretold that the descendants of the great conquerors of the ancient world will not, even so, have any success. After several unavoidable failures the warlike fervour of Italy will cool, and she, without having on the shores of the Red Sea any vital interests whatever, will readily, it may be supposed, enter upon a series of compromises,[2] satisfactory only for the sake of the preservation of her dignity, and she will end in possessing some sort of Abyssinian port further south, such as Assab or Edda, but she will not always continue to hold Massowah.

If, however, contrary to our belief, the Italian troops remain satisfied with results already attained, and confine themselves to the shores of the

[1] In order to subjugate the mountainous country of the Caucasus, which has a depth of only about 300 *versts* (200 miles) Russia was employed for a period of 100 years, and this, too, under incomparably more favourable conditions than Italy would encounter. The mountaineers of the Caucasus were split up into numerous hostile tribes, and their armament was extremely bad.

[2] As a precedent we may cite recent events in Indo-China.

Red Sea and give up all idea of advancing further inland, then, impelled by the force of circumstances, Abyssinia might herself assume the offensive, because for her the struggle constitutes a vital question. But in that case, according to our deep conviction, the end will be the same as the beginning, and it will not be Italy that will remain the gainer.

And yet, if the importance for Western Europe of the Red Sea and of the countries thereto adjacent is immense, it is of great importance, too, for Russia, although at first sight she has lesser interests in both the Red Sea and in Abyssinia. Nevertheless, the maintenance of Russian influence in Abyssinia must not be lost sight of. As to the question of any Colonies, that is one about which, though there may be still disputes, it may be said that the possession of any such would not bring in any distinct gain to Russia.

By establishing her influence in Abyssinia, Russia would become the neighbour of Egypt. Now Egypt, as the vassal of Turkey, has always furnished an auxiliary corps for service in the ranks of the Turkish Army. In other words, she has helped to strengthen our opponent. In the future we should be able, if necessary, to come to the aid of Abyssinia by giving Egypt something to do at home and to paralyse her army.[1]

At a given moment, with Egypt in the arms of England, Russia, by possessing a certain influence in Abyssinia, might compel her to occupy herself with her own affairs on the banks of the Nile.

Italy is a member of the triple "defensive" alliance which is directed against us. If, therefore, it were possible to draw off even a portion of her strength from the European theatre of war, that alone would constitute a substantial success for us. The enmity of Abyssinia towards Italy and her nearness to the Italian Colonies on the Red Sea would give us the power of easily effecting this.

There is no sort of doubt then that sooner or later war-like Abyssinia will make a way for herself towards the sea and will possess the entire western coast-line. Then we could easily acquire from her one of the southern ports that would be less needful to her. This port would have for us a deep signification as a coaling station, but still more as a source of perpetual threat to the welfare, and consequently to the power, of England.[2] Our torpedo-boats and cruisers could thence at any moment close to English merchant steamers the trade route through the Red Sea, and this would of course cut in half the trade relations of the English. The possibility thus afforded to us of closing this route would compel the proud Britons to considerably lower their tone, which is always and everywhere hostile to us, and it might do much to aid in the settlement of the Eastern Question in a sense that is to be desired by Russia.

Besides all this, as soon as Abyssinia had made a way for herself to

[1] Although at present the numerical strength of the Egyptian Army is infinitesimal, the question of its increase has been raised.

[2] And in a lesser degree to other Colonial Powers.

the sea her contact with civilised nations would induce her to introduce to her people a quantity of fresh necessaries, and the supply of these would tend to greatly develop our own manufacturing industries, and might, indeed, place them in a peculiarly favourable position. On our part, we could get from Abyssinia colonial products at first hand. The opening up in this way of a fresh market would aid in developing and increasing all our mercantile operations, and this would act as a powerful stimulant on the welfare of our people and enhance the value of our currency.

All these are results to which we could attain by establishing our influence in Abyssinia. The question then arises: Is it possible for us to get this influence? Yes, undoubtedly. More than once already has almost Orthodox Abyssinia, with her population of 800,000, and her great natural riches, stretched out her hand to us. As we have already said, quoting the testimony of Mons. Lejean, the French Consul at Massowah, in the year 1855 the Negus Theodore addressed a letter to the Emperor Nicholas I., offering to conclude an alliance against the Turks, and asking him to send to Abyssinia military instructors. Again, in 1874 and 1876, Negus John made fresh but fruitless efforts to enter into friendly relations with Russia. Once more, in 1879, it was said that the desire had been shown throughout Abyssinia to receive a Metropolitan upon whom hands had been laid by our Most Holy Synod. And in the summer of 1887, the foreign Press announced that at Massowah the Italians had detained an entire Abyssinian mission, which had been sent by the Negus to Russia with a request for assistance. All this, and the history of the Cossack Aschinoff's several receptions by the Negus, afford ample testimony that if Russia desires to do so she can easily establish and secure for herself in Abyssinia a strong position and acquire great influence in that country.

The deeper and the more varied the forms of our influence over the life of Abyssinia, the more solid, of course, will that influence become. Our engineers, mechanics, and craftsmen can build up there an industry, and our enterprise and skill can secure a hold on both the import and the export trade. This would give us the command of the economic life of Abyssinia. The appointment by our Holy Synod of an Abyssinian Metropolitan would surrender the country to us in a religious sense. The despatch of military instructors and the formation of a body of Abyssinian regular troops under the guidance of Russian officers would place in our hands the armed forces of the country. Having thus subjected Abyssinia to herself in an economic, religious, and military sense, Russia could extend her influence there to the desired limits, and the results of so doing would everywhere become apparent.

The present struggle between Abyssinia and Italy presents a suitable opportunity for us to lay the beginning of fresh relations. Under present circumstances not much would be needed to be done to cause the sympathy of Abyssinia towards Russia to grow to the desired degree. The acquirement of so vast an influence might, on the termination of the war, be extended so as to make itself felt also in the administration of

the country. This is, in short, an historical moment and one that should not be allowed to slip away.

The Russian author's interesting sketch of Abyssinia does not, unfortunately, embrace the period of the downfall of Italian ascendency in this part of Africa; but what the future may have in store for the ancient Kingdom of Ethiopia can, to a certain extent, be forecast by carefully watching the drift of current events, and by noticing the great change which has come over this remarkable country since the period of the Anglo-Indian Campaign of 1867-68.—W. E. G.

THE NECESSITY FOR AND PRACTICABILITY OF A FEDERAL AUSTRALIAN ARMY.

By Lieutenant CECIL LAMB,
New South Wales Artillery (1st Garrison Division).

IN dealing with this national question on a somewhat difficult subject I shall divide my paper into two parts, viz.:—

1. The Necessity for a Federal Force.
2. The Practicability of a Federal Force.

As I am essentially a soldier, I consider it my duty to avoid the political aspect of the situation as much as possible.

The Necessity for a Federal Force.

I think all patriotic soldiers and sailors of our Great British Empire will admit that a federal force would be of vast importance to these great Australian Colonies.

We doubtless all remember the little story told to us in our childhood days of the "young man" trying to break, for firewood, a bundle of sticks which were tied together; and how an "older and wiser man," seeing what he was trying to do, told him that "union was strength," and, taking the bundle of sticks out of the young man's hand, he extracted them singly, and broke them up in detail. Our different Australian forces of the several colonies are like these single sticks, and could be broken up by a strong and resolute enemy; nothing being more certain than that the small isolated armies of Australia would fall an easy prey to an enterprising foreign Power intent on territorial aggression, as pointed out by the late Sir H. Parkes, K.C.M.G., in his book "Fifty Years in the Making of Australian History." We are taught that the geographical position of the Colony of New South Wales renders it little liable to aggression from a foreign Power, except raiding attacks of cruisers on our coast-line of approximately 600 miles; but in dealing with the question of federal defence there is to be reckoned the very large coast-line of Australasia (8,500 miles), and if a force of an enemy was established on any portion of Her Majesty's Australasian

soil it would be our sacred duty—nay, of paramount importance to ourselves—to oust the enemy out of any position that he might take up.

We must look on the subject of military federation from a broad and patriotic point of view, and not from a narrow or purely local point. Even if our worthy and enterprising capitalists, merchants, and shopkeepers cannot see their way clear to amalgamate their finances and commerce, and have one tariff and one set of laws for Australia, on the ground of there being too many pressing local requirements to consider, still it is the duty of our naval and military authorities, with the sanction of their respective governments, to consider how they can overcome the difficulty of using a small portion of the finances accruing from the revenues of these great Colonies for creating an efficient federal army; for it is undoubtedly a matter of vital importance that the defence of Australia should be very complete in case the mother country were involved in war, and the capital invested in these colonies should be safe from foreign aggression.

At the United Service Institution of Victoria a paper was read, 3rd October, 1895, entitled "Australia's Military Duty to the Empire," by Lieut.-Colonel Hall, Commanding Metropolitan Brigade Victorian Garrison Artillery, and in the discussion which followed—Major-General Sir C. Holled Smith being in the chair—the secretary of the Imperial Federation League, Mr. H. D'Esterre Taylor, pointed out that "the seaboard commerce of Australia was valued at £35,000,000, and if this commerce were subject to a raid by a foreign Power without protection, we would be at the mercy of that Power at once, and Australia might be reduced at a very short time to a state of national insolvency."

We all know that history repeats itself, and the British race may be drawn into a struggle practically to fight for its supremacy against the world, like the British have done before, and as they had to do in the war against the Great Napoleon in 1807, when he declared the British Isles blockaded. It is well known how jealous some foreign Powers are of the British Empire's commercial supremacy, independence, and power, and what great efforts they make yearly to increase their Navies and Armies, and push their trade, and how they consider what a splendid prize some parts of the Australian Colonies would make. For an enemy to engage in operations on our soil a large expeditionary force of all arms, fully equipped, would be required. But might not Russia and France combine, and, with their vast hordes of armed men and their powerful Navies, try and break the power and wealth of our glorious Empire?

Russia has 24 army corps (about 4,000,000 armed men), and Japan possibly, with its 45,000,000 of people and her powerful and well-organised Army and Navy, might throw in its lot with Russia and France, and have a try to get a slice of Great Britain's rich Australian Colonies. Japan in the late war against China placed on the Chinese territory 70,000 men completely equipped and thoroughly trained and organised; and she has now the war indemnity of £12,000,000 which she exacted, to

spend in further developing her resources; £8,000,000 of this money are already being spent upon increasing her Navy. Might not a combination of any two of the above Powers, in these days of large and quick transports, spare a powerful naval and military force which, fitted out at Vladivostock,[1] Saigon,[2] and Hiroshima, and sailing by different routes so as to avoid the British fleets, might concentrate off the West Coast of Australia, elude the Australian Squadron, or, beating the Australian Squadron off, seize Fremantle and Albany? Perth and Fremantle would be knocked to pieces unless the mineral wealth of the Coolgardie goldfields lying in the banks[3] were deposited in the holds of the enemy's vessels; and then, provided the British fleets could be eluded, their gold might be taken away to pay the Armies and Navies of Russia and Japan, and to recoup their treasuries, exhausted by carrying on the war against the British Empire. The fort at Albany could be overpowered by the superiority of fire that could be brought to bear on it, and the port seized, the coal taken, and the mail steamers holding our people's wealth sunk or captured. The trade converging upon Albany is estimated at £67,000,000 per annum.

Then the cry of the people of these Colonies would be:—"The enemy must be ousted and our commerce and home protected." But which individual colony is going to weaken her own defence to do it? Could Great Britain do it? Hardly, as her troops would be absorbed in protecting the frontiers of India against Russia, and other of her Crown possessions against the aggression of the French; therefore the matter would rest with the Australian forces. With our little separate armies it may take time to settle about the finances and organisation of those troops—probably too long—and thus give sufficient time to the enemy to get away with part of our wealth, and cause a great loss of confidence in ourselves as an independent and free people. Let us pause to consider deeply and seriously about the fall of one nation's prestige in 1870; and let it be remembered that troops raised in a hurry and untrained, and commanded by unprofessional leaders, are almost useless under conditions of modern warfare when matched against trained soldiers.

If the above picture that I have drawn is too imaginative, let me direct attention to the position of Tasmania, with her undefended harbours and financially starved defence force, which is a menace to the whole continent of Australia. If a combination of two of the great Powers fitted out an expedition, and the Australian Squadron was eluded, and Hobart[4] taken, as a base of future operations against this continent, what colony at the present moment would be prepared to send her own troops, paid with her own money, to fight for the advantage or security of

[1] 5,200 miles.

[2] 4,000 miles from Sydney; Saigon 3,700 miles from Brisbane; 4,800 miles from Auckland. New Caledonia is 800 miles from Brisbane; 1,100 miles from Auckland.

[3] £500,000 (half a million).

[4] It is contemplated that fortifications will be commenced in the near future.

the other colony, and hunt the enemy out? The people of New South Wales and Victoria will say a combined force of these two colonies. What combined force? Organisation of military units, to be of sufficient strength and striking power, cannot be built up in a few days or hours. It must be a properly organised force to work harmoniously under one controlling head, and the machinery will have to be well oiled and greased before it is started off at the word "Mobilise."

These foreign aggressions, that may occur in the next great war, will have to be destroyed by a Federal Force of Australia, apportioned to each Colony in proportion to its expenditure. On the discussion which followed on the paper read by Major-General Owen, R.A., entitled the "Military Defence Forces of Australia," at the Royal Colonial Institute, in May, 1890, Lieut.-General H. Brackenbury, C.B., said:—"We wish the Australian Colonies to understand that the only attack to which their seaports can reasonably be considered liable is the attack of *a small force of cruisers* which may escape the vigilance of our fleet. We want them not to be milch cows for gunmakers and inventors—not to waste their money on Zelinski guns and Brennan torpedoes and torpedo-boats, and ironclad fleets, but to confine themselves to such moderate defence as is necessary against such attack as is reasonably probable." "It is necessary, we say, that in the organisation of our forces Australia should go forward in the path she has been pursuing, and in which she has done right good work. And what we are most anxious to see is that she should bring, as far as possible, the whole of these forces under one uniform organisation. . . . So that, should need arise for one colony to reinforce the other, they should readily fit together as one system. As an Englishman, I believe it is the future of Australia to dominate the Pacific, and I say that Australia never will do this by merely looking to her own defence. War is not brought to an end by simply acting on the defensive—'the counter-blow must be struck.' Is Australia simply to act on the defensive and leave others to pull the chestnuts out of the fire for her? No! And I do not believe that it is her wish. . . ."

No matter how sincere and patriotic each of the Governments of these great Australian Colonies may be to have their own Colony's system of defence complete, these Governments are controlled by the electors of the Colony and the democracy at large, who mostly consider the military department an expensive luxury, where all money goes out and nothing comes in; consequently, what do we see—cheeseparing of military estimates, which necessarily pulls down any previous building-up of efficiency and organisation, while the Government and military authorities are unable to carry out any continuous military policy of any duration. Colonel E. T. Hutton, late Commandant of our New South Wales Army, in his lecture on "Our Comrades of Greater Britain," points this out. He says:—"I place the want of a continuous or fixed policy of defence as the first and most serious of the difficulties under which the military of Greater Britain labour." "Governments change far more rapidly in our self-governing Colonies than at home, and the fluctuating changes of policy and the

vicissitudes experienced in passing the military estimates through Parliament render it impossible to look forward from one year to another with any degree of certainty. It requires no demonstration to show how difficult it is to inspire enthusiasm and maintain military efficiency when not only the maintenance of each and every member of the force, but even of the force itself, is a subject of yearly uncertainty when the military estimates are submitted to Parliament. . . . The military forces of our Colonies which will have to take the field must possess a complete military system and organisation, and cannot rest content with a number of disconnected fragments. . . . With the exception of one of the Australian Colonies, and perhaps two, a military force as a complete military unit of organisation does not exist."

It might be, God forbid! that these disconnected fragments, if they continue to exist for years to come, might be used by rival Governments of Colonies to be turned at one another's throats to enforce duties being paid by one Colony to another in that bitter, vexed question—the war of the tariff, or some other political or local question of the masses. It is not so many years back that Victoria claimed half the flow of the River Murray, and to enforce that claim placed a police officer in a boat loaded with tobacco, rum, etc., etc., challenging the New South Wales Government to levy duty upon it. That officer (since dead) told a friend of mine that the crew were armed, and that the Victorian officer had instructions to resist any interference on the part of the New South Wales revenue officer. Owing to the forbearance of the New South Wales Government, greater force was not resorted to. The Imperial authorities eventually decided that Victoria's boundary did not extend beyond the southern bank of the river. But if we had one military service for the whole of these great Colonies, under one law and system, and one wise controlling power, with the force actuated by one grand patriotic spirit, *e.g.*, the integrity of Australia and defence of our soil from foreign aggression, the military would then probably remain "United" until the rival people who wished to employ them against their comrades saw that such an awful calamity as a civil war could not exist as long as there was a United Force for Australia.

In concluding the first part of this paper, I would like to quote some remarks on Major-General J. Bevan Edwards' report by the Colonial Defence Committee:—

"Australia and New Zealand possess an enormous coast-line, with numerous points against which such raids as have been referred to might possibly be directed. In the absence of any organised force on shore even a small number of men landed for a short time would be enabled to inflict grave damage. To meet these requirements it appears essential to provide an adequate force, well organised and capable of being rapidly mobilised, since it is at the outset of the war that the probability of a raid is greatest. . . . . In the event of a great war the military resources of the Empire will be heavily tested, and the responsibility for land defence must necessarily rest with the Colonies."

"It would be of great importance to interfere with the industrial machinery as little as possible. Relief of garrisons or posts would doubtless be required, entailing the maintenance of a higher total strength than would be necessary in the case of a Standing Army."

Finance and Controlling Power.—Having shown a few of the necessities for a United Australian Army, let us now deal with the solution of the practicability of a Federal Force.

We will take the most difficult subject first, and the most interesting to the taxpayer and vexatious to us soldiers—that of £ *s. d.* Quoting again from Colonel Hutton's lecture on "Our Comrades of Greater Britain," at Aldershot, when dealing with Australian Federal Defence, he concluded his remarks on this subject by saying:—"This offensive-defensive force becomes the federal force of Australia, and is apportioned to each colony in proportion to its population. The federal force thus created by joint co-operation of the Australian Colonies comprises a complete[1] mounted brigade and a complete infantry[2] division, each being provided with the proper proportion of administrative and departmental troops, so as to be able to take the field at the shortest notice. . . . . This military system can be formed without the addition of a single penny to the military estimates of each Colony, and by merely utilising the existing military establishments." No doubt there is a well-thought-out scheme of military federation which has been carefully and practically considered by the different commandants of these Colonies at their conferences held from time to time; but, not knowing anything of what has taken place, I cannot discuss their propositions. If I had any idea of the matter discussed at these conferences I would not give my ideas on this subject, which might probably not be in accord with the views of older and more experienced officers than myself.

On the assumption that the Imperial Government will not help us financially (which seems only fair when we consider the average expenditure approximately per head of the Australian Colonies for defence is only 2s. 9d., while Great Britain is spending for defence approximately per head 17s. 4d.), Great Britain would utilise a portion of the auxiliary squadron subsidised by these Colonies of Australia to protect the transporting of our offensive-defensive federal force to any portion of Australia's waters that the general in command, with the sanction of the Federal Council, might desire it to. I do not see how we can avoid additional outlay. The difficulty might be overcome to a certain extent if we base our argument on the following proposition, viz., by simply uniting the sums together at the disposal of the six Australian Colonies for military expenditure.

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[1] Brigade of Cavalry (Lord Wolseley): 3 regiments, 1,986; 1 battery R.H.A., 190; department's total, 2,557.

[2] Division of Infantry (Lord Wolseley): 2 brigades of infantry, 6 battalions, 6,646; 1 battalion of rifles, 1,000; 1 regiment of cavalry, 661; 3 batteries of F.A., 549; department's total, 9,607.

The consolidated revenue for defence purposes during 1894-95, according to Mr. T. A. Coghlan, is as follows:—

Colony.	*Amount.*	*Per head.* s. d.	*Naval.*
N. S. Wales ..	£272,358[1]	4 5	£37,961
Victoria	194,020	3 3	35,767
Queensland ..	63,068	2 10	15,503
South Australia ..	34,236	1 11	10,690
West Australia ..	16,128	3 11	2,490
Tasmania ..	12,425	1 7	4,776
	£592,235		£105,187
Deduct Naval subsidy	£105,187		
	£487,048	left for military expenditure.	

[2]

Here we have our Colony of New South Wales at the top of the list, and we spend £78,383 more than Victoria; this can be accounted for to a certain extent by our having a large coast-line to defend, and our forces are distributed over a larger area of land. Taking the strength of the Australian military forces at the end of 1894, of these six Colonies, and reckoning staff, Regulars, Militia, partially paid, and Volunteers, we have, according to Mr. T. A. Coghlan's Statistical Account:—

N. S. Wales[3]	5,564
Victoria..	6,901
Queensland	3,440
South Australia	2,033
West Australia	776
Tasmania	1,411 B
Total	20,125

Colony.	*Military expenditure.* *1869*	*1894*	*Cost per head.* *1869* s. d.	*1894* s. d.
N. S. Wales ...	£32,343	£272,358	1 3	4 4
Victoria	37,422	199,722	1 0	3 4
Queensland ...	3,940	63,067	0 8	2 10
South Australia	13,580	36,561	1 6	2 8
West Australia	184	9,621	—	2 2
Tasmania ...	1,454	12,424	0 2	1 6
	£88,923	£593,753		

[1] Exclusive of £48,979 loan expenditure on military works.

[2] Includes contribution to Australian Squadron.

[3] The figures relating to N. S. Wales, Victoria, Tasmania, and Queensland include members of Australian Rifle Clubs, who are all trained to the use of the rifle and do certain amount of drill, thus making them in time of need available to fill the ranks of the Militia forces—about 4,500 men. The members of Rifle Clubs of N. S. Wales, numbering 650 men, were enrolled as a *Volunteer Reserve Force in 1895.*

Since these figures were quoted at the end of 1894, changes may have taken place in the organisation and strength of Australia's forces. The six Colonies above-mentioned possessed a force of 20,125 troops, while it will be seen at that time New Zealand owned 4,387. Before we go on to the working of these troops together as a united force, we must consider how, where, and by whom the sum of £487,084, left for military expenditure authorised by the six Australian Colonies, is to be controlled.

As New South Wales is paying per head on her naval and military expenditure 1s. 2d. more than Victoria, 6d. more than West Australia, 1s. 7d. more than Queensland, 2s. 6d. more than South Australia, and 2s. 10d. more than Tasmania, it would seem fair to the other Australian Colonies that the headquarters of the Australian Army should be Sydney. Sydney, the other Colonies must remember, is the strategical naval base of the Southern Seas, which renders the security of the Colony, and this port in particular, of vital importance not only to the well-being of the Colony itself, but to the supremacy and maintenance of the British Navy charged with the protection of the whole of Australasia's interest in Australian waters. Sydney would probably be the base of any combined operations of the Australian troops to seize New Caledonia, German New Guinea, or to oust the enemy from Thursday Island, Port Darwin, Tasmania, or some of the numerous coastal towns on the New Zealand coast, which he may have temporarily seized. Sydney is in a good central position, geographically speaking, for the concentration of an expedition to set sail from a good port under the protection of the British squadron in those seas. Presuming it is a foregone conclusion that these great Australian Colonies must federate for a system of intercolonial free trade, lighthouse, quarantine, etc., surely we could come to some amicable arrangement for the controlling of the military expenditure.

To have one organised force properly equipped and capable of overcoming any resistance that it may meet with, there must be one military tariff or system of military expenditure or payment of the force. Therefore, the General in supreme command, the Chief of the Staff, the Quartermaster-General, the Chief Paymaster, and their staff should have their headquarters in Sydney. The money for military expenditure would be remitted to the charge of the Federal Council for deposit in the Treasury of Sydney from the different States or Colonies by the 20th of each month, and this in return would be distributed to the Major-Generals commanding in the different Colonies to distribute in the usual manner for payment of troops and for such military works and establishments as might be directed by the Commander-in-Chief through the Federal Council.

An objection might be made to this system, as it would create an extra military department, in fact an Australian War Office, and necessarily cause extra expense. If it could not be amicably arranged for the war office to be situated at Sydney, then let the war office follow the Federal Council, say, two years in each of the capitals of the six Colonies. Obviously the objection to this would be the expense of shifting the Army headquarters. But it would have this good result, that

the Commander-in-Chief and his staff would have under their eyes any slack body of troops which might have got lethargic from being away in some remote capital or town. Tasmania would pay into the military treasury £12,425 as already shown; and Tasmania, which in the present position of her starved system of defence and badly defended coast is a menace to the other Colonies, would therefore do better to partially disband her present force and the Federal Council or Government utilise this contribution, or nearly all of it, for the payment of the brain of their Army, *i.e.*, the Commander-in-Chief and his staff, and leave Tasmania with a small number of permanent artillerymen to look after the forts and a small force of Volunteer infantry and artillery with the necessary departmental and administrative troops and submarine miners. Such a force as I speak of to be merely a nucleus to a larger force should cost a very small sum to maintain, as the troops would be all purely volunteer, except the small number of permanent artillerymen drawing regular pay, the other portion no pay at all. It would be to the interest of the other Colonies in the event of war and a threatened attack on Tasmania to send a force of federal troops over there, but if the Tasmanian tax-payers would not give up their local force, then the Colonies would have to subscribe the amount among themselves for the controlling government of the Army.[1]

The different Colonies would be asked by the Federal Government on the recommendation of the Commander-in-Chief, to vote a certain sum for a federal camp of instruction, which sum, levied in proportion to population, would not amount to as much as under the present system, when each Colony has its own isolated camp. The Commander-in-Chief and his staff would decide as to the locality, which could be arranged for strategical purposes, bearing in mind favourable ground for manœuvring. The advantage of a federal camp is this: up to the present there has been merely a meeting of the commandants to arrange the federation; but by the federal camp being held it would give the troops an opportunity of showing how the federal military machinery would work, and of putting into practice the idea and plans originated from time to time. By placing £2,400 annually for Tasmanian defences, this would leave a

[1] *Proposed Troops—*

2 Regular Submarine Miners ...	Cost about	£1,000
15 Regular Artillery		
250 Volunteer ,, ...		
200 ,, Infantry		900
33 Departl. troops & Submarine Miners		500
500		£2,400

Distribution of Tasmanian Force, 1892—

Staff	7
Permanent Artillery ,, Submarine Miners	33
Militia and partially paid	535
Volunteers	1,272
	1,847

balance of £10,000 per annum for the payment of the headquarters staff and travelling expenses of the staff while going round to periodically inspect the different troops and defence works and establishments of the Army.[1] Though the headquarters staff might be slightly lower paid than the different staffs of the general officers commanding in the other Colonies, the headquarters staff would be acting under the Commander-in-Chief's authority, and the officers would, of course, be personally responsible to him for their different departments. When the system, utility, and practice of the "brain of the Army" was gradually worked in and thoroughly understood, and jealousies of the staff of the other States became less, then these staffs could be slightly reduced, and the headquarters staff increased in rank, pay, and number.

Uniform Payment of Troops and Act Under Which They Would Serve.

The late grand old statesman of Australia, Sir H. Parkes, writes, in his book "Fifty Years in the Making of Australian History," when dealing with Federation for Defence:—"No doubt the Imperial Parliament, on application of the Colonies, could pass an Act to constitute the Federal Army under one command and to authorise its movement to any part of Australia or Australasian waters." The Regular forces of New South Wales are bound by the Army Act, Queen's Regulations, and other regulations common to the Imperial Army (by Act of N.S.W. Legislature[2]), which answer exceedingly well here for the government of the Regular troops in that Colony, with certain local modifications. The Regular forces of the other Colonies are more or less under the Army Act, and it would be a very simple matter at the present time for the different Parliaments of the Colonies to pass a law that the Regular forces come under Military Law the same as the New South Wales Regulars.

The Regular troops must have the same system of payment. Instead of paying them at the same rate, as at present, it could be slightly under that amount, and arrangements made with the money saved, with a little

[1] *Proposed Controlling Government of the Army—*

Commander-in-Chief	£2,250	Lieut.-General
Adjutant-General	1,250	Major-General
Quartermaster-General	900	Colonel
Military Secretary	900	Colonel
Inspector-General of Fortifications and of Engineers	900	Colonel
Director of Military Intelligence	850	Colonel
Director of Artillery	800	Colonel
Aide-de-Camp to the Commander-in-Chief	450	Captain
	8,300	
Staff clerks and travelling expenses ...	1,700	
	£10,000	

[2] *Title—*

"An Act to provide for the Regulation and Discipline of the Military and Naval Forces in the service of Her Majesty's Government of New South Wales." (May, 1871.) 34 Vic., No. 19.

added to it, for a proper retiring allowance for the officers when the limit of age was reached and a small pension to those non-commissioned officers and men who earned it, with facilities thrown out for employment in a civil capacity for those officers and men who were capable of work. The efficiency of troops must necessarily become hindered unless the older officers and non-commissioned officers and men know there is something besides the actual wages for good, long, honourable, and gallant service, and they cannot retire with a good feeling to the Service at the proper time and allow the younger officers to try and follow in their footsteps. If provision is not made for the promotion of the younger officers at the proper time they naturally become disheartened, and the progressive military machinery becomes clogged. In fact, as the Regular forces would be serving under the Army Act of 1881, they should also have the advantages of the "Royal Warrant for the Pay, Appointment, Promotion, and Non-Effective Pay of the British Army" on a scale suitable to the Federal military expenditure consistent with economy.

But we must start gradually, and not rush at the obstruction of finance. Later on the Federal Government might see their way clear to put a proper system of retirement in force, the details of which would be, of course, worked out by the headquarters staff. The Regular Artillery and Engineers would be enlisted for seven years' Army service and five with the Reserve, or eight years' Army service and four in the Reserve. So as not to lose the men entirely after the expense of teaching them their work, an Army Reserve should be established under similar lines as the Reserve Forces Act of 1882 of the British Army. So as to avoid expense, the adjutants of the Regular corps would keep touch with the men by certificates being sent periodically that the men were in a certain part of Australia, and thus it would be known where they were to be found if wanted. The Reserves would be paid when called out for service. When the military authorities had more funds at their disposal, arrangements could be made to keep completely in touch with the men, and they could be paid a small retaining fee at 4d. per day issued quarterly in arrear.[1]

The partially-paid troops of Australia should be unreservedly a "Militia," governed by the Militia Act, 1882, with certain local conditions to suit Australian life and customs of the country, but any conditions common to one Colony must be distinctly common to the whole of the other Colonies. For instance, a Militiaman desiring to go away from a certain district in which his military unit is situated must either obtain leave to do so, or must purchase his discharge, or join the same branch of the Service in another part of the country where his work has taken him.

The Regular troops of Australia would, of course, be liable to serve wherever the Federal Government desired them to go, and as obviously

[1] *Training of Army Reserves*—
These men would be liable to be called out annually for twelve days, or twenty drills, and may be attached to a body of the Regular forces, or to the Militia, Yeomanry, or Volunteers.

the Militia of Australia, being so much in the majority, are the backbone of the military system in these Colonies, it would be absolutely essential that the Militia be liable to serve in case of imminent national danger when embodied anywhere the Federal Council might consider necessary.

Why I urge the claims of a Militia is that I consider it the easiest method of getting out of the difficulty of the question, "Which of the Colonies is going to abandon its Military Act and take up the other?" As there are different Acts more or less in the different Colonies, it would greatly help to destroy jealousy if the British Army Militia Act was adopted—of course, as before stated, with certain modifications as to period—for enlistment for the different branches of the Service. These details, though absolutely necessary, I am afraid I cannot put forth here.[1] However, I can add that when we have our controlling headquarters it will be their duty to thoroughly thrash all these questions out, and for the Federal Government to give the legal sanction.

The different Volunteer Regulation Acts of the different Colonies concerned would have to be repealed, and the necessary Act passed, so as to secure uniformity of administration throughout all branches when subject to Military Law, and provision made for billeting of troops and impressment of carriages, etc., in time of war. Such an Act should state a General Discipline Act in which provision could be made for the troops of one Colony serving in another Colony, and setting out the circumstances under which the troops could be sent or withdrawn (*vide* letter from Mr. Duncan Gillies, Premier of Victoria, to Sir H. Parkes, in November, 1889). Besides our Active Militia, we should have to provide a Militia Reserve. The Reserves should be divided into two classes, viz.:—1st Class, after serving the prescribed time in the Active Militia; and, 2nd Class, the present Reservists system of N. S. Wales—men furnished by the different civilian rifle clubs, the other Colonies to adopt the same system. In time of national danger the 2nd Class Army Reserve would be brought under the Army Act.

The 1st Class Militia Reserve would go to complete the war strength of battalion and regiments, while the 2nd Class—those furnished by the C.R.C.—would go to the depôts of their respective corps and learn a little more of military customs before they were drafted out to their respective

[1] *Militia Act of 1882.*

Enlistment for a term not exceeding six years, re-engagement allowed up to 45 years for successive further terms not exceeding six years each.

Militia Recruits liable to preliminary training not exceeding six months.

Annual training of Militia, usually not less than 21 days and not more than 28 days, may be extended to 56 days.

When subject to Military Law:—

1. During training.
2. When attached to the Regular forces.
3. When embodied.
4. Officers subject to Military Law at all times.

Proposed Length of Service Militia:—

Army Service	...	Artillery, 5 years	... Reserve Service, 3 years.
Army Service	...	Engineers, 5 years	... Reserve Service, 3 years.
Army Service	...	Other branches, 3 years	Reserve Service, 3 years

corps to furnish casualties, etc. It would not take long to steady down the 2nd Class Reserves, as it must be remembered at the present time they are learning a certain amount of drill, and all of them are good shots.

With regard to training of the 1st Class Militia Reserves, Major Brereton's suggestion, in his lecture on the "Advantage of a Militia," 27th April, 1892, seems to be a good one, viz.:—"One day's training in each half-year for imparting instruction in changes of drill and armament if necessary." Pay at the rate of 8s. per day to all men attending, which would put the cost of each 1st Class Militia Reservist at 16s. per annum. Reserve of officers paid at the present scale for their attendance. The Reserve of officers would be on the war establishment of their depôts, and when called out each officer would be placed at the bottom of his rank in the regiment to which he is appointed.

There would be no additional expense to N.S. Wales for the 2nd Class Reservists, as they would continue to get the Government grant of ammunition when earned for efficiency, as at present, and only be paid if put under Military Law on an emergency. The payment of the Active Militia would be on the same scale as is adopted in N.S. Wales at present for her partially-paid troops, *i.e.*, payment for actual work done, or one of the systems adopted by some of the other Colonies; but whatever system of pay is adopted, it must be the same throughout in the Australian Militia, otherwise on mobilisation we should be liable to have confusion and jealousies.

Organisation and Allotment of Troops.

Now it is the opinion of Colonel Hutton and other officers who have commanded in Australia, that we must have sufficient troops to protect the strategical centres, and at the same time have enough strength to strike at any enemy and send him out of Australia or Australian waters, or occupy any important key or position that he may have designs on. Basing our disposition of troops on the supposition that the offensive-defensive force of Australia will be a complete mounted brigade and infantry division, the Colonies would have to find the following troops, broadly speaking, viz.:—

Mounted Brigade[1]: 3 regiments of mounted troops and 1 battery of horse artillery, and necessary administrative and departmental troops:—

Colony.	*Description of Troops.*	*Numbers.*
N.S. Wales ..	1 regiment, 6 squadrons	360
,, ..	Army Ser. Corps and M.S. Corps ..	110
Victoria	1 batt. Mounted Infantry, 6 cos. ..	360
,, ...	1 battery Horse Artillery, 6 guns ..	90
South Australia ..	Mounted Infantry, 3 companies ..	180
Queensland ..	Mounted Infantry, 3 companies ..	180
	Total officers and men ..	1,280

[1] *Vide* Lord Wolseley.

	Officers and men.	Mules and horses.	Carriages.
Infantry Division...	9,607	2,640	403
Brigade of Cavalry	2,557	2,405	158

When mobilised for war, such a force should expand to 2,280 officers and men.

COMPLETE INFANTRY DIVISION.

Two Infantry Brigades (each brigade 3 battalions infantry), 1 regiment cavalry, 3 batteries artillery, and necessary departmental and administrative troops, viz. :—

Colony.	*Description of Troops.*	*Numbers.*
N.S. Wales ..	2 bns. Infantry, each bn. 4 cos. 75 men ..	600
,, ..	1 battery F.A., 6 guns	90
,, ..	1 company Engineers	100
Victoria ..	2 bns. Infantry, each bn. 4 cos. 75 men ..	600
,, ..	1 regiment Cavalry, 4 squads, 90 men ..	360
,, ..	1 battery F.A., 6 guns	90
Queensland ..	1 battalion Infantry, 4 cos. 75 men ..	300
,, ..	1 division Reserve Amnt. column ..	100
,, ..	½ battery F.A., 3 guns	45
South Australia	1 battalion Infantry, 4 cos. 75 men ..	300
,, ..	1 company A.S. Corps, Medical Staff, and 3 field hospitals	150
,, ..	½ battery F.A., 3 guns	45
	Total	2,780

When mobilised for war, about 3,780 men and horses, and 18 guns. Thus, if we reckon our complete mounted brigade on its war strength 2,280 officers and men, and complete infantry division 3,780 officers and men, we should have a force of 6,060 officers, men, and horses, and 24 guns, including the necessary administrative and departmental troops, without which no body of troops can be properly organised and equipped.[1]

[1] This Mounted Brigade and Infantry Division would still leave the Colonies for defence of harbours and strategical centres, roughly speaking, the following:—

Showing what Forces could remain in Australia if mobile troops required elsewhere.

New South Wales ...	3 batteries of Artillery 2 regiments of Infantry 1 regiment of Cavalry 1 battalion of Mounted Infantry 9 companies of Garrison Artillery Engineers, Staff, and necessary Departmental and Administrative Troops, about 4 battalions of Volunteers, and if necessary the Reserves.
Victoria	2 batteries of Artillery 2 regiments of Infantry 1 regiment of Mounted Infantry 1 regiment of Cavalry 9 companies of Garrison Artillery Engineers, Staff, and necessary Departmental and Administrative Troops, and Volunteers, with Reserves, if necessary.
South Australia ...	1 battalion of Artillery 2 regiments of Infantry ½ battalion of Mounted Infantry 3 battalions Garrison Artillery Engineers, Staff, and necessary Departmental and Administrative Troops, Volunteers, and Reserves.
Queensland	A little more than South Australia.

These troops would become the mobile force of Australia. It does not follow that all these troops would be taken for operations against an enemy; that would be a matter for the Commander-in-Chief to settle. This mounted brigade and infantry division would have to work together at a Federal Camp of Instruction, as before mentioned; and in order to give the remainder of the Militia the distinction and experience for being told off for this important service, and to get the whole system of Federal Defence to work together, the different troops of the mounted brigade and infantry division could be changed from time to time as thought fit by the Commander-in-Chief.

Mobilisation of the Army.—We should have our War Office, with the Commander-in-Chief and his well-trained and highly efficient staff, and the War Office would get their general instructions from the Federal Council depending on the political aspect of the situation. We should have under one uniform organisation one Regular Militia with their Reserves (1st and 2nd Class), and last, but by no means least, that patriotic body of officers and men, the Volunteers. The whole of these troops would be at the disposal of the Federal Council and the War Office authorities. Detailed instructions and carefully thought-out schemes of defence would have been previously issued to the major-generals in command at the different Colonies, based on a defence scheme to suit local requirements. The mounted brigade and infantry division would be concentrated on the nearest point available, if an enemy had seized certain portions of Australia, or if required to seize New Caledonia, accordingly as political events showed themselves in Australian waters, or that part of the Pacific and seas immediately to the north of Australia that we Anglo-Australians have an interest in in common with Great Britain. Even if all the mobile troops were sent away, the remainder of the Army should be sufficient to protect the important commercial and strategical centres. But we must have a mounted brigade and infantry division ready to strike at the enemy before he comes hammering at our back doors, approximately near our commercial centres, and to prevent him getting a base of operations on some strategical point.

Amalgamated Permanent Forces of Garrison Artillery and Submarine Miners.

This would be a fortress corps consisting of the permanent forces of garrison artillery and submarine miners (engineers), and with some slight increase to its numbers. When the Federal Military Vote became larger the corps could be utilised to garrison King George's Sound, Thursday Island, and other strategical keys; and, in case of war, the nearest Colony which could spare the troops would be ordered by the Australian War Office authorities to send a proportion of infantry to those points. The Regular artillery and submarine miners would be systematically relieved all round the different parts of Australia every three years in lethargic climates, and every seven years elsewhere. Promotion would be facilitated and *esprit de corps* would be generated, and the officers and N.C.O.'s would get the necessary local knowledge about the different important garrisons, which would stand this country in useful knowledge

when, after a certain regimental experience, they might be selected for the staff of the different Colonies for a portion of their service on the same lines as the Imperial Army.

Some such system as changing periodically the permanent troops without partiality, favour, or affection, should be initiated for the officers and N.C.O.'s of the general staff, adjutants of Militia and Volunteer regiments, and the staff of the major-generals in command of the different Colonies. Promotion of officers and N.C.O.'s should take place on any position becoming vacant by the War Office authorities filling up the vacancy with the best men. The additional outlay should be small, as the railways are Government property, and any small expense of travelling that the Federal Military Treasury was put to would be money well laid out, as this system would give officers experience of the Federal Army and localities, and assist to work the whole Australian forces together as one large well-built and oiled military machine.

EDUCATION OF OFFICERS AND N.C. OFFICERS, MILITARY COLLEGE, UNIFORM SYSTEM OF ARMAMENT, GUN WHARF AND ORDNANCE STORE, SMALL-ARM MANUFACTORY, RAILWAYS, AND AN AUSTRALIAN UNIFORM.

I will now end this somewhat lengthy paper with a few brief remarks on these subjects.

Education of Officers, and Federal Military College.—Let the Australian troops first continue rigorously the system in the whole Army as adopted in New South Wales by strictly adhering to the "Rules for Schools of Instructions," and give no officer or senior N.C.O. his promotion either on the Staff or in his regiment, till he has passed through the school and obtained the necessary certificates. Let the system of examining majors before promotion to lieutenant-colonel be adopted for their tactical fitness for command in the field. The Adjutant-General at the War Office would be responsible in addition to his other duties to the Commander-in-Chief that the instruction imparted in these schools was enforced by the major-generals in command in the different Colonies as one uniform system common to the different branches of the Service, so that the natural mutual cohesion should follow when the federated troops were called on to work together. When there is enough money let a Federal Staff College be established in a part of Australia away from disturbing influences and in a climate conducive to study. Senior officers in addition to this could be sent out to India to be present at the manœuvres, and to England to undergo training at the colleges.

Uniform System of Armament.—The Director of Artillery would be responsible to the Commander-in-Chief that the Colonies were endeavouring to adopt one uniform system of armament suitable to local requirements; changes in armament should take place gradually so as not to cause too much expense to the Federal Military Treasury.

Artillery workshops, gun-wharves, and ordnance should be established at the headquarters with necessary local branches. All guns and artillery appliances obtained from Great Britain.

Small-arms Manufactory and Powder Manufactory to be established, or any present one thoroughly initiated, so we could turn out our small-arms, ammunition, and our powder for the common use of the Federated Army.

Railways.—Volunteer railway corps established in all the Colonies on the same lines as the present one being organised in New South Wales, and in time of war these corps would have the responsibility of assisting the civilian railway authorities with their military knowledge for transport of troops. Armed trains should be initiated for coastal defence, especially near coaling ports and jetties where the railway runs close to the sea-board.

It would not be necessary to alter the gauge, which alteration would involve a large additional outlay. When part of the infantry division and mounted brigade came from Sydney and Melbourne to concentrate on Brisbane, or *vice versâ*, a break in the journey at the Queensland border would considerably refresh the troops, and the trucks with the stores and equipment and other *impedimenta* could be lifted by cranes bodily off their wheels on the Queensland gauge, and placed on wheels on the New South Wales gauge. Little delay should take place, and, if the Federal Railway Volunteers were properly organised, no confusion.

Dress for the Federal Army.—There should be one system of uniform respectively for engineers, artillery, cavalry, infantry, departmental and administrative troops, suitable to Australian climate and surroundings, consistent with smartness, soldier-like appearance, utility, and economy. As the Australian soldiery undoubtedly are part of the British Army, could not some of the minor distinctions of dress, carrying with them deeds of renown of the fighters of the British Army, be worked in? *e.g.* :—The Regular artillery and engineers adopt in Australia the same dress as the R.A. and R.E. in India in the summer, and the dress of the artillery and engineers in Great Britain in the winter. Later on, an Army clothing manufactory might be started in Victoria or New South Wales, to make the sealed patterns of dress, and clothe the Regulars, and sublet contracts out to private firms for Militia and Volunteers.

Conclusion.

I have merely touched on the most difficult part of this subject, *i.e.*, the practicability of a Federal Army, as space will not admit of my going into the wearying details, much as I should like to do so, which is so absolutely necessary to put the subject into thorough working order.

At the same time, it must be remembered I have urged that the controlling power, or Australian War Office, should be the proper authorities to work out the necessary details so essential to a well-governed military machine. Detail is everything in military operations, and unless we can thoroughly grasp the details of our noble profession we can never properly master the more intricate and scientific subjects connected with military organisation. Finally, I have an honest conviction that if we ever want to be a useful military body, and defend our Australian Colonies adequately, WE MUST BE ONE AND UNITED.

NAVAL NOTES

HOME.—The following are the principal appointments which have been made: Captains—G. H. Cherry to "Volage"; H. S. F. Niblett to "Edgar"; J. E. Bearcroft to "Philomel"; F. S. Inglefield to "Devastation." Commanders—W. Ricketts to "Hibernia"; C. G. Chapman to "Desperate"; A. G. Meredyth to "Flying Fish"; J. J. Graham to "Panther"; R. B. Wrey to "Brisk"; L. F. G. Tippinge to "Buzzard"; H. A. Phillips to "Sphinx"; C. E. Gladstone to "Eagle"; Ian M. Frazer, D.S.O., to "Melita."

The second-class battle-ship "Devastation" was commissioned at Devonport on the 8th inst. for service as port-guard-ship at Gibraltar, where she will take the place of the coast-defence-ship "Rupert," which ship will probably be placed in the Reserve at Malta. The first-class cruiser "Edgar" was commissioned on the 1st inst. at Devonport for relief service to China; she will convey new crews to Hong-Kong for the despatch-vessel "Alacrity," the sloop "Daphne," and the gun-boats "Pigmy," "Plover," and "Redpole." The Port-guard-ship Squadron, consisting of the "Nile," "Trafalgar," "Sans Pareil," and "Thunderer," under the command of Commodore Bainbridge, arrived at Plymouth on the 13th ult. at the conclusion of their cruise round the coast, and dispersed to their several ports. The third-class cruiser "Philomel" is to be commissioned for service on the Cape of Good Hope and West Coast of Africa station. The first-class cruiser "Diadem," having completed her trials, has left to join the Channel Squadron.

The Admiralty having decided to mobilise the Reserve Squadron, the ships have had their crews filled up to their sea-going strength, and have been coaled, their stores completed and minor defects made good; where necessary they have also been docked and had their bottoms cleaned and re-coated. The squadron is assembling in Plymouth Sound and at Portland, and will consist of the following ships:—

First-class battle-ships—"Nile," "Trafalgar," "Sans Pareil," "Benbow," "Rodney," "Collingwood," "Howe."
Second-class battle-ships—"Thunderer," "Alexandra," "Colossus."
First-class armoured cruisers—"Australia," "Galatea."
Second-class cruisers—"Melampus," "Severn."

It is rumoured that one division consisting of the port-guard ships will proceed with the "Devastation" to Gibraltar, temporarily relieving the Channel Squadron, which will return to England, while the second division consisting of the coast-guard ships will cruise round the English coast.

Steam Trials.—The new third-class cruiser "Pactolus," built by Sir W. G. Armstrong, Whitworth, and Co., and engined by Messrs. John Penn and Son, in her final full-power trial last month obtained, in the teeth of a rough sea, the highest I.H.P. yet recorded for a vessel of her class; the results were as follows:—Draught of water—forward, 11 feet 9 inches; aft, 15 feet 8 inches; speed of ship, 20·5 knots; steam pressure in boilers, 253 lbs. per square inch; air pressure in stokeholds, 3·3 inches; vacuum in condensers—23·2 starboard, 23·9 port; revolutions per minute—216·1 starboard, 211·6 port; mean I.H.P. (for four hours), 3,639 starboard, 3,562 port—total 7,201; the contract stipulated for a speed of 20 knots, with 7,000-I.H.P., under forced draught; the "Pactolus" returned to Chatham for her machinery to be opened out for inspection preparatory to the vessel being passed into the Medway Fleet Reserve. A sister-ship, the "Pegasus," has also successfully completed both her eight hours' trial under natural draught and her four hours'

forced-draught trial; the results of the natural-draught trial were as follows:—Draught of water, 10 feet 10 inches forward, 15 feet 2 inches aft; speed of ship, 20 knots; steam pressure in boilers, 278 lbs. per square inch; air pressure in stokeholds, ·86 inch; vacuum in condensers—25·4 starboard, 26·4 port; revolutions per minute—201·9 starboard, 204·6 port; mean I.H.P., 2,712 starboard, 2,688 port—a total of 5,400; the contract stipulated for a speed of 18·5 knots, with 5,000-H.P.; the trial was an unqualified success, and the boilers (Reed's patent) did their work most efficiently. The results of the forced-draught trial were equally satisfactory, the official record being as follows:—Draught of water—forward, 10 feet 4 inches; aft, 14 feet 10 inches; speed of ship, 21·2 knots; steam pressure in boilers, 255 lbs. per square inch; air pressure in stokeholds, 2·44 inches; vacuum in condensers—25·3 starboard, 25·0 port; revolutions per minute—216·6 starboard, 218·9 port; mean I.H.P., 3,596 starboard, 3,538 port—total 7,134; the contract requirements of 7,000-H.P. and a speed of 20 knots were thus exceeded; the 30 hours' run, for coal-consumption trial, of the "Pegasus" had been equally successful, the coal consumption—216,800 lbs., or 1·96 lbs. per I.H.P. per hour, being considerably lower than that of any sister-ship yet tested, while the speed was very satisfactory, an average of 17·26 knots being maintained, with 3,698-H.P.

The new torpedo-boat destroyer "Avon" has completed her final trial with the following results:—Draught of water—forward, 5 feet $2\frac{3}{4}$ inches; aft, 8 feet $3\frac{1}{4}$ inches; speed of ship, 30·164 knots; steam pressure in boilers, 225 lbs. per square inch; air pressure in stokeholds, 3·75 inches; vacuum in condensers—22·1 starboard, 22·4 port; revolutions per minute—388 8 starboard, 380·4 port; mean I.H P., 3,105 starboard, 3,138 port—total, 6,243. The contract stipulated for 30 knots with 6,000-H.P. The speed was considered good, having regard to the choppy sea which prevailed when the trial took place.

The new torpedo-boat destroyer "Sylvia," built and engined by Messrs. Doxford & Son, Sunderland, has also successfully completed her coal-consumption and speed trials. At the former trial the consumption was $2\frac{1}{2}$ lbs. per unit of power per hour, which gave her a speed of $29\frac{3}{4}$ knots. At the speed trial the mean speed of six runs over the measured mile was 30·194 knots, with 6,600-I.H.P., while the mean speed of the three hours' run was, with 383 revolutions and 6,500-I.H.P., 30·0077

The "Fawn," another new destroyer, built and engined by Palmer's Shipbuilding Company, Jarrow-on-Tyne, has also carried out her speed trials at Portsmouth. She is the seventh of the 30-knot destroyers furnished by this company, all of which have been successful at their trials. At the coal-consumption trial she averaged a speed of 30·267 knots, with 6,454-I.H.P. and 396·4 revolutions, while the coal consumption was the exceedingly low average of 2·24lbs. per unit of power per hour. At her full-speed trial, when the coal consumption was not a factor, she made a mean speed of 30·462 knots, with 402·9 revolutions and 6,581 I.H.P. She had to encounter a high wind and heavy sea, otherwise she would have made an additional quarter of a knot.

The torpedo-gunboat "Seagull," which is the only vessel in the Navy fitted with the Niclausse type of water-tube boiler, had an unsuccessful trial lately at Portsmouth, as after she had run for two hours and three-quarters, when it was estimated that the speed was 17 knots, the trial had to be abandoned. The engines had, with 240 revolutions, worked up to 2,500-H.P., which was all that was expected, but at this speed the vibration was so great that two low-pressure cylinder drain pipes, two low-pressure jacket drain pipes, the starboard intermediate indicator pipe, and the port gearing to the steam valve of the reversing engine were sheared right through as though they had been cut with a knife. As it was feared that more important pipes would be severed, the trial was abandoned before the ship reached the measured mile in Stokes Bay. During the trial the boilers gave no trouble, and the engines worked satisfactorily until the vibration became excessive and led to the shearing of the pipes and rods. The Niclausse

type differs from all other water-tube boilers, inasmuch as the boiler consists of a series of slightly inclined double tubes, one inside the other, attached at the front end in such a manner that the cold water flows down the inside tube and returns to the front between the two tubes when heated by the action of the fire and hot gases on the larger outside tube. An ingenious arrangement of diaphragms is fitted at the front ends of the tubes, completely separating the downcoming water from the ascending currents of hot water and steam. Each vertical row of tubes discharges into a separate header, making the currents of each series quite independent of the others. The header also acts as a means of feeding the inner tubes, and conveying the steam from the outer tubes to the steam cylinder. The special peculiarity of the Niclausse boiler is the inner and the outer tubes, and whereas the ordinary water-tube averages 3 inches in diameter, the Niclausse tube does not exceed an inch and a quarter in diameter. There are six boilers in the vessel. To each boiler there are 12 headers, and each header has 16 tubes, but whereas the water-tube boilers in the cruisers of the "Diadem" class are capable of bearing a pressure of 300 lbs. to the square inch, the boilers in the "Seagull" have not been tested beyond a pressure of 200 lbs. During the trial the boilers answered admirably, and were not affected by the vibration. It is expected that the trials will be resumed in about a month.—*Times*.

Launches.—The first-class cruiser "Spartiate" was launched at Pembroke on the 27th ult. Her dimensions are as follows:—Length between perpendiculars, 435 feet; extreme beam, 69 feet; mean draught at load displacement, 25 feet 3 inches; weight of hull, 6,975 tons; displacement, 11,200 tons. She is built on the combined longitudinal and transverse system of framing, and her engine and boiler-rooms, magazines, shell-rooms, and other vital portions are enclosed beneath a curved steel deck, which varies in thickness from 2½ inches in the middle and towards the extremities of the ship to 4 inches along the slopes at both sides for a considerable portion of the ship's length in the central part. Above that deck a double row of coal bunkers along each side affords additional protection, computed to be equal to 13 inches of iron armour on the sides. The hull is plated with steel $\frac{5}{16}$ inch thick, but thicker plates are worked in places where exceptional strength is required, and the bottom and sides, to a height of several feet above the load-line, are sheathed with teak wood 4 inches thick and coppered, to prevent fouling, thus enabling the ship to keep the sea for a long time without her speed being materially impaired

Her main armament will consist of sixteen 6-inch Q.F. guns, of which twelve will be mounted in casemates and four behind armour shields, two on the forecastle and two on the poop deck. The casemates, which are formed of Harveyized armour, 6 inches thick in front and 2 inches thick at the rear, are fixed at intervals along the sides, four being situated on the main and four on the upper deck on each side. In addition the ship will carry twelve 12-pounder Q.F. guns, two mounted on pedestals in the admiral's cabin aft, and the remainder at side ports on the upper deck; three 3-pounder and two 12-pounder Q.F. guns, the latter for boat and field service; and eight Maxim guns. She will also be fitted with two submerged torpedo-tubes, and will carry twelve 18-inch Whitehead torpedoes. The conning-tower is formed of 12-inch armour, while armour tubes, 2 inches thick, connect the casemates with passages situated below the protective deck at both sides, and the ammunition can be transported through them from the magazines to the guns under protection. The "Spartiate" will be fitted with electric ammunition hoists.

The propelling machinery, for the supply of which Messrs. Maudslay, Sons, and Field are the contractors, will consist of two identical sets of vertical twin-screw triple-expansion engines, each having four cylinders, of which the diameters are:—High pressure, 34 inches; intermediate pressure, 52½ inches; and low pressure (two in number on each engine), 64 inches. The length of stroke will be

4 feet. The auxiliary machinery, in addition to the bilge and fire-pumping and feed engines, the latter on the Belleville patent principle, will include fourteen fans, two steering and two capstan engines, two air compressers, capable of pumping a pressure of 3,000 lbs. to the square inch; eight ash-hoist, two coal-hoist and two boat-hoist engines, one workshop, and three dynamo engines. Evaporators and distillers, capable of producing from salt water 32 tons of fresh water in an absolutely pure state daily, will also be fitted on board. The boilers, thirty in number, will be of the improved Belleville water-tube pattern with economisers, and the tubes, which number in the aggregate, 4,700, will be required to stand a pressure of 1,500 lbs. to the square inch before being connected together. The completed boilers will be tested at 450 lbs. to the square inch, and the normal working steam pressure will be 300 lbs. The steam will be conveyed from the boilers through rivetted steel pipes to the engines, when it will be reduced to a pressure of 250 lbs. to the square inch, and with that, running at full speed, the engines are estimated to make 120 revolutions per minute, and to develop 18,000-H.P. unitedly, and maintain it continuously during a sea trial of eight hours' duration. The ship will be lighted throughout by electricity, supplied from three dynamos, each capable of generating a current of 600 ampères and 80 volts, at a speed of 300 revolutions to the minute; and six search-lights, each of 25,000 candle-power, will be fitted on board.

As the following table shows, there is a curious difference in the cost of the eight cruisers of this class, although all the ships are practically identical:—

Name.	*Where Built.*	*Cost.*
"Andromeda"	Pembroke	£531,887
"Niobe"	Barrow-in-Furness ...	£552,692
"Diadem"	Glasgow...	£550,127
"Europa"	Clydebank	£561,126
"Ariadne"	Clydebank	£535,557
"Argonaut"	Glasgow...	£543,705
"Amphitrite"	Barrow-in-Furness ...	£545,227
"Spartiate"	Pembroke	£518,623

—*Naval and Military Record.*

On the 27th ult., there was also launched from the yard of the London and Glasgow Engineering and Iron Shipbuilding Company, Govan, the second-class cruiser "Hyacinth." This vessel is of the improved "Dido" and "Isis" type—both of which vessels were built by this firm two years ago—her dimensions being:—Length between perpendiculars, 350 feet; beam, 54 feet; displacement, 5,600 tons on 20½ feet, and 6,300 tons on 22 feet mean draught; I.H.P., 10,000. The vessel is constructed of Siemens-Martin mild steel, made by the Steel Company of Scotland. There is a cellular double bottom the entire length of the engine and boiler space, and the flats of the magazines and shell-rooms carry the double bottom practically to the ends of the vessel. Instead of the armour protection to the cylinders, as in the "Dido" and "Isis," the protective deck has been raised in wake of engines and boilers, so as to completely protect them, and a considerable saving in weight has thus been effected. This has been utilised in several different ways throughout the vessel to make her more efficient. The protective deck has a thickness 3 inches on the sloping sides, and 1½ inches in the centre or flat part. This deck completely encloses the machinery, magazines, and shell-rooms, steering gear, and torpedo-room, etc. The armoured conning-tower is of the latest Harveyized steel, 6 inches thick, and gives protection to the steering gear, telegraphs, compass, torpedo directors, voice-tubes, etc., and from the bottom of tower to the protective deck there is an armoured tube 3 inches thick, down which the telegraphs, steering shaft, and principal voice-tubes and bells are carried.

The coaling arrangements also differ from those of the former ships, and as special attention has been given to the subject of coaling by the Lords of the

Admiralty recently, this vessel is being specially treated in this respect, and the arrangements are not yet quite complete. Owing to the introduction of the Belleville boilers the cross bunkers have been dispensed with, and the space thus lost has been made up for above the protective deck, so that the actual coal capacity will be rather more than less than in the "Dido" and "Isis."

Besides the steam steering engines in the engine-rooms, there is a new compensating steering gear fitted aft under the protective deck. This gear was specially designed at the Admiralty, and was first fitted in the "Dido," and has proved so satisfactory in her that the Admiralty have, with a few slight modifications, arranged to have it fitted in this vessel also. The vessel is to be fitted up with a complete installation of electric light, including three search-lights, yard-arm reflectors, and the usual signalling lamps.

A very important addition to this vessel over many predecessors is a refrigerating plant for preserving fresh meat, vegetables, and for making ice, which should be of immense advantage when the vessel is stationed in a hot climate. This plant is fitted in the forward part of the vessel, and is by the Linde British Refrigerating Company, Limited. Another important innovation is the introduction of steel in place of wood in every available space, such as in store-rooms, cabin bulkheads, and sundry fittings. Instead of the usual wood lining in the cabins the steel bulkheads are panelled with an ornamental asbestos covering, so that the risk of fire is reduced to a minimum.

The vessel has the usual ram bow of solid phosphor bronze, which is carried well into the framework of the vessel, while the stern-post, shaft brackets, and rudder are also of phosphor bronze. The ship will have a much bolder appearance above water than her predecessor, inasmuch as the masts are very much loftier, and there are three large funnels in place of two. The vessel has a much more powerful armament than the "Dido" and "Isis," their 4·7-inch Q.F. guns being replaced by 6-inch Q.F. guns. There are eleven of these weapons placed in the most advantageous positions throughout the ship, besides nine 12-pounder Q.F. guns, six 3-pounder Q.F. guns and six ·45-inch Maxim guns. The six 3-pounder guns are placed in the two military tops with which the masts are fitted. There are also two 18-inch underwater torpedo-tubes.

The machinery of the "Hyacinth" consists of two sets of triple-expansion engines and eighteen Belleville water-tube boilers. Each set of engines has four cylinders, viz., one high-pressure, one intermediate, and two low-pressure. The diameter of the high-pressure piston is 26 inches, intermediate 42 inches, and low-pressure 48 inches. The stroke is 30 inches. The revolutions at full power are 180. The two forward and the two after engines have the cranks arranged directly opposite to each other, and the cranks of the forward pair are at right angles to those of the after cylinders. The low-pressure cylinders have flat slide valves, the high-pressure and intermediate have piston valves; these are worked by the ordinary link motion. The condensers are gun-metal castings, flat-sided and designed to lie close in to the back of the columns, so as to save space and allow a passage behind the engines next to the ship's side. They have a cooling surface of 9,580 square feet. The two air-pumps are 24 inches diameter by 15 inches stroke, and of the ordinary type, worked by levers from the high-pressure piston-rod crosshead. Each set of engines drives a three-bladed gun-metal propeller, which runs inwards. Two cylinder reversing and turning engines are provided. The auxiliary engines in the engine-room are four water and bilge pumps, two main centrifugal circulating pumps, and two auxiliary circulating pumps, with air-pumps attached. These auxiliary pumps work in conjunction with the auxiliary condensers, into which the exhausts from all the auxiliary engines are led. The engine-rooms are separated by a water-tight bulkhead running fore and aft. Cross connections are made between all the auxiliary machinery, so that the work of each may be available in either engine-room.

The boilers, eighteen in number, are of the Belleville latest type, with economisers. They are arranged in three separate boiler-rooms, and are fired fore and aft. Each boiler consists of nine elements, each element consisting of seven pairs of 4-inch tubes Each economiser consists of nine elements, each element consisting of six pairs of 2¾-inch tubes. According to the latest requirements of the Admiralty, all tubes were prepared for the boilers in the works of the builders, special plant having to be put down for this purpose. The boiler safety valves are loaded to 300 lbs. per square inch, and the pressure is reduced in the engine-room to 250 lbs by two Belleville reducing valves placed between the engines and the bulkhead valves.—*Engineer.*

Armour-Plate Trials.—An official trial took place at Shoeburyness last month of a 9-inch armour-plate manufactured by John Brown & Co. (Limited), of Sheffield. Three Holtzer armour-piercing projectiles weighing 380 lbs. each were fired from the 9·2-inch gun with a powder charge calculated to give a striking velocity of 1,900 foot-seconds in each case. All the projectiles were completely shattered. The indents in the plate were estimated not to exceed some 3 inches or 4 inches in depth, and, with the exception of a few superficial hairlines, the plate withstood the impacts without showing any cracks. By this trial Messrs. John Brown & Co. (Limited) have now completed the series of tests required by the Admiralty for the most recent quality of armour, and plates of 6 inches, 9 inches, and 12 inches in thickness respectively have satisfactorily fulfilled the service conditions.

A Cammell steel armour-plate, 11·8 inches thick, treated by the Krupp-Harvey process, was also tested last month at Shoeburyness, in the presence of Government officials. Three Holtzer armour-piercing projectiles, each weighing 720 lbs., were fired from the 12-inch B.L. gun with striking velocities of about 1,860 feet per second, developing energies of over 17,000 tons. All three projectiles were completely broken up, the penetrations into the plate being in each instance under 4 inches. The plate was perfectly free from cracks after the first and second rounds, and only one fine line was observed after the third round from the point of impact to the upper edge of the plate. The test fulfilled the Admiralty conditions in a highly satisfactory manner.

A Vickers armour-plate has also been satisfactorily tested at Shoeburyness. The plate was less than 9 inches in thickness, the actual measurement being 8·8 inches. Three Holtzer armour-piercing projectiles, each weighing 380 lbs., were fired from a 9·2-inch B.L. gun with velocities varying from 1,870 feet to 1,900 feet per second. In each instance the shell was broken up on the face of the plate, and there were no cracks.—*Times.*

Hard-Faced Armour.—According to present indications, says a writer in *Cassier's Magazine*, the Krupp process of hardening armour-plate for war-ships seems to be giving results superior to the older and better known Harvey process. Some trials recently made in the United States, at Washington, D.C., showed that projectiles with a striking velocity of 2,000 feet per second passed clean through a Harveyized nickel-steel plate, while the striking velocity of a projectile of the same calibre had to be raised to 2,350 feet per second before it passed through a Krupp nickel-steel plate of the same thickness. The rule in such cases is that a projectile will pass through as many inches of wrought iron for each 1,000 feet per second of striking velocity as it is inches in calibre. Thus a 6-inch projectile with 1,000 feet per second of striking velocity will just perforate 6 inches of wrought iron; while with a striking velocity of 2,000 feet per second it will just perforate 12 inches of wrought iron. At the resistance of Harveyized nickel-steel is exactly double that of wrought iron, we must use twice the striking velocity to perforate a plate of this material. It is evident that a projectile of the calibre used in the Washington trials would have gone through a wrought-iron plate of the same thickness as the two on trial with a striking velocity of 1,000 feet per second. The relative resistance of Harveyized and Krupp armour-plates is, therefore,

taking wrought iron as 1, as 2 is to 2·35. This gives the plate made by the Krupp process at the Carnegie Steel Works, at Pittsburg, a slight, though positive, superiority over British armour-plate made last year by the same process, the ratio being 2·35 to 2·33. Of course, it is understood that when the test is one of armour-plate only, the question of the relative penetrative power of projectiles plays no part in it so long as these are able to perforate the armour without breaking up.

The comparative figures, giving the resistance of different kinds of armour-plate, which were arrived at after exhaustive tests by British experts in the latter part of the year 1897, are interesting. The experts agreed that wrought iron 14 inches thick; steel-faced armour, 11 inches thick; Harveyized nickel-steel armour, 7 inches thick; and Krupp nickel-steel armour, 6 inches thick were equal in resisting power. The saving in weight thus effected by the substitution of Harveyized or Krupp armour for wrought iron is enormous.

Taking advantage of the fact that by suitably controlling the process of cooling, it is possible to obtain some of the newer alloys of iron with nickel cobalt and manganese in either a hard or a malleable condition, M. Jean Werth, manager of the Société Anonyme des Hautes Fourneaux et Acieries de Denain et Auzin, has, says *Engineering*, devised a new process of making armour-plate. M. Werth's contention is that the plate should have the same chemical composition throughout, and that the hard face should be obtained entirely by a process of tempering. Ordinary carbon steel in large masses cannot be tempered satisfactorily, but when alloyed with suitable proportions of nickel, cobalt, or manganese, it is possible to obtain the metal in a hard state by heating it up to a bright red and allowing it to cool in the air; whereas, if heated only to a dull red and cooled, the metal will be malleable and comparatively soft. The steel used by M. Werth is open-hearth metal, free from sulphur and phosphorus. It contains from 5 per cent. to 15 per cent. of nickel or cobalt, and from 2 to 12 per cent. of manganese; while within certain limits silicon, chromium, or tungsten may be present without interfering with the process of tempering. In its soft state such a steel has a tensile strength of 110,000 lbs. to 140,000 lbs. per square inch, and a strip $1\frac{1}{4}$ inches thick can be bent without cracking round a radius equal to its thickness. After the plate is completed it is tempered by making it part of the side or bottom of a furnace. The face next the fire becomes heated to a bright red, while by means of water or air the temperature of the back face is kept down to 800° or 900° Fahr. To insure good results the heating is effected very gradually, the plate being put into a cold furnace; and by preference gas fuel is employed in the latter. Another method of effecting the heating, which is however only applicable to flat plates, is to immerse their front faces in a bath of red-hot lead, the temperature of which is maintained very uniform. When ready, the plate is removed from the furnace and cooled at the back, until the front face has sunk down to a temperature of 800° to 900° Fahr., when no further attention is required, though if warped it can now be straightened before the cooling is finished.

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The Minister of Marine:—Visits of Inspection.—M. Lockroy, the Minister of Marine, returned to Toulon on the 21st ult. from Algiers, on board the first-class armoured cruiser "Pothuau," having completed his visit to Corsica and the Tunisian and Algerian ports. His visit to Corsica was made chiefly with the view of selecting a *point d'appui* for the fleet, and it is reported that the following decisions have been arrived at:—

Bastia and Bonifaccio are to be made important torpedo-boat stations, the latter in particular is stated to be an ideal torpedo-boat shelter, being a deep narrow fiord 1 mile long and 100 yards wide, in an excellent strategical position, the entrance also being invisible from seaward.

Porto Vecchio, situated on the south-east corner of the island, is to be made a fleet harbour, and considerable works are to be undertaken for deepening and improving it for this purpose. Its strategical position is excellent, being but a short distance from the Italian naval port of Maddalena, in Sardinia, and on the line of route a squadron would take proceeding to and from Maddalena and Spezia.

The following is the present condition of Bizerta:—

The town lies between the sea and the immense lake, which is connected with the sea by a canal, now made navigable for the largest ships. Leaving Bizerta, the canal widens out, forming three bays with 30 to 40 feet of water, ending in the lake, which towards its centre has a surface of three square miles of water with a depth exceeding 10 metres (33 feet), a number of beacons and buoys marking out the 9-metre (29 feet) line; the whole is a natural formation, the canal only having had to be made, and it is surprising that this excellent maritime position, both from the points of view of strategy and navigation, has been so long unutilised.

As regards its defence, two batteries are now completed and the emplacements of others are marked out, and were visited by M. Lockroy. The mobile defence is established in one of the three bays in the canal, where the torpedo-boats are moored about 100 yards from the shore; they number nine, of which four are new first-class boats, the old cruiser "Talisman" serves as workshop and barracks, and the aviso torpedo-vessel "Flèche" also lies near, together with the armoured coast-defence ship "Tempête." The "Talisman" will soon be abolished, as barracks are being built on the ground reserved for the mobile defence.

At the further end of the lake, on the southern shore, an arsenal is in course of construction at Sidi-Abdallah, which will be quite out of range of any bombardment from sea; it will, however, require to be strongly defended on the land side so as to prevent its being taken in reverse. The arsenal port is formed by two piers inclining together at the entrance, the eastern one being 800 metres (874 yards) and the western one 500 metres (574 yards) long; these are completed except the stone coping of the eastern one.

On shore, at present the only buildings are a workshop for the men employed on the piers and a building for the officers, but judging by the progress made the arsenal buildings when commenced will soon be erected.

M. Lockroy has stated that a torpedo-boat station is to be formed at Sfax, Tunis.—*Le Temps.*

Mediterranean and Northern Fleets.—In the September number of the JOURNAL we gave details of the new composition of the French Mediterranean and Channel Fleets; in view of the present crisis, it may be as well to repeat them.

The Mediterranean Fleet is now composed of nine first-class battle-ships, including the three employed as gunnery and training ships. The fleet is commanded by Vice-Admiral Fournier, the junior and youngest Vice-Admiral on the list, who is 56 years of age; his second-in-command is Rear-Admiral Roustan, while the three ships of the training division are under the command of Rear-Admiral Godin.

The following is the list of the first-class battle-ships composing the fleet :—

——	Launch.	Displacement.	Chief Armament.	Nom. speed.	Complement.
First Division :—		Tons.		Knots.	
Brennus (*flag-ship of Commander-in-Chief*)	1891	11,395	Three 13·4″, ten 6·4″ Q.F. guns.	17·1	696
Masséna	1895	11,924	Two 12″, two 10·8″, eight 5·5″ Q.F. guns	17·5	642
Bouvet	1896	12,200	Do., do.	17·5	631
Second Division :—					
Charles Martel (*flag-ship of Rear-Admiral Roustan*)...	1893	11,880	Two 12″, two 10·8″, eight 5·5″ Q.F. guns	17·5	632
Carnot	1894	12,000			625
Jauréguiberry	1893	11,824			625
Training Squadron :—					
Magenta (*flag-ship of Rear-Admiral Godin*)	1890	10,850	Four 13·4″, seventeen 5·5″ Q.F. guns.	16·5	660
Marceau	1887	10,850			
Neptune	1887	10,983			

The cruiser or Light Division of the fleet is under the command of Rear-Admiral Maréchal, and is composed of four groups, as follows :—

First Group—

First-class armoured cruisers—"Pothuau" (flag-ship of Rear-Admiral Commanding), "Chanzy," "Latouche-Tréville."

Second Group—

Second-class cruisers—"Cassard," "D'Assas," "Du Chayla."

Third Group—

Third-class cruisers—"Lavoisier," "Linois," "Galilée."

Fourth Group—

Torpedo-avisos—"Casabianca" to be relieved by "Dunois," "Lévrier," "Hallebard," and six torpilleurs-de-haute-mer, one of which is attached to each of the battle-ships of the squadron for coaling, and provisioning purposes, etc.

Further available are the three cruisers at present detailed to form the tactical school in the spring :—

First-class cruiser—"Amiral-Charner."

Second-class cruisers—"Friant," "Davout."

The second-class cruiser "Bugeaud" is in Cretan waters with the torpedo-cruisers "Vautour," "Condor," and "Faucon."

Forming the Reserve Fleet in Toulon are the four coast-defence battle-ships—"Amiral-Tréhouart," "Bouvines," "Valmy," and "Jemmapes," to which may be added the "Caïman," "Terrible," and "Indomptable"; the last-named, however, is undergoing important alterations. Although there are other cruisers available, the above list practically exhausts the battle-ships fit to enter the fighting line, with the exception of the "Friedland" which may be compared with our "Sultan."

Northern Squadron.—The Northern Squadron, under the command of Vice-Admiral Sallandrouze de Lamornaix, with Rear-Admiral Touchard as his second

in command, is now stronger than it has been for some years, and is composed as follows :—

——	Launch.	Displacement.	Chief Armament.	Nom. speed.	Complement.
First-class battle-ships :—		Tons.		Knots.	
Formidable (*flag-ship of Commander-in-Chief*)	1885	12,165	Two 14·6″, eight 6·4″ Q.F., eight 5·5″ Q.F. guns.	16·0	640
Amiral-Baudin	1883	11,911		15·0	630
Amiral-Duperré (*flag-ship of Rear-Admiral*)	1879	11,209	Four 13·3″, one 6·4″, fourteen 5·5″ Q.F. guns.	14·2	664
Second-class battle-ships :—					
Courbet	1881	10,808	Four 10·8″, four 9·4″, six 5·5″ Q.F. guns.	15·4	669
Dévastation	1879	10,704		15·2	685
Redoutable	1876	9,437	Eight 9·4″, six 3·9″ Q.F. guns.	14·6	700

Cruiser Division :—

First-class armoured cruiser—"Dupuy de Lôme."

Second-class cruiser—"Catinat."

Third-class cruiser—"Surcouf."

Torpedo-avisos—"Épervier," "Cassini"; with three torpilleurs-de-haute-mer—"Lancier," "Aquilon," and "Mangini."

The only other first-class battle-ship available in the Channel is the "Hoche." This vessel, once the flag-ship of the squadron, has been in the dockyard hands at Cherbourg, changing her boilers and undergoing other repairs and alterations, but she is now reported to be practically ready for sea again. She was launched in 1886, has a displacement of 10,997 tons, and a principal armament of two 13·4-inch and two 10·8-inch guns, with eight 5·5-inch Q.F. guns, eight Q.F. guns of smaller calibre, and 12 machine guns. Of the new battle-ships, the "Charlemagne" and "Gaulois" approach completion at Brest; but like the "St. Louis," which is in a rather more backward state at Lorient, they are intended for the Mediterranean, and neither their heavy guns nor the materials for their turrets have yet been received from Saint Chamond. The "Iéna," at Brest, cannot be completed for another 18 months or two years, and the "Henri Quatre" is still on the stocks at Cherbourg; at which port are also the old coast-defence ships, the "Furieux" (6,019 tons), the "Requin" (7,822 tons), the "Tonnant" (5,100 tons), and the "Vengeur" (4,700 tons), which were all launched at various dates between 1878 and 1885; of these the "Requin" has lately undergone some improvements; there are also in reserve the armoured gun-boats "Cocyte," "Phlégéton," and "Grenade," which however are of little value as fighting-vessels. The number of older battle-ships in reserve has been much reduced, several having lately been struck off the effective list of the fleet. Both in the Mediterranean and the Channel ports there are a large number of small vessels and torpedo-boats available.

JAPAN.—*Launch of the "Shikishima."*—This new first-class battle-ship, the first keel plate of which was laid in the second week of April, 1897, on the same slip as that previously occupied by the "Fuji," and which in launching weight—8,250 tons—is heavier than any previous vessel of her class that ever went down the ways in any shipyard in the world, was on the 1st inst. successfully launched from the Thames Ship-building Yard into Bow Creek.

Her dimensions are as follows :—Length between perpendiculars, 400 feet; length over all, 440 feet; beam, extreme, 75 feet 6 inches; draught, mean

loaded, 27 feet 3 inches; displacement at load draught, 14,950 tons. From these figures it will be seen that the "Shikishima" when completed for sea will be the largest and most powerful battle-ship afloat, seeing that the largest vessels of her class in the British Navy are but of 14,900 tons displacement when their bunkers are filled with 900 tons of coal, leaving but 14,000 tons for the weight of the vessel, her machinery, armament, etc.; whereas the new Japanese battle-ship, with her 14,950 tons displacement, and a coal-carrying capacity of 700 tons only, will have 250 tons more weight in her hull, engines, and armament, etc., than vessels of the "Majestic" class. Being intended for the home service of the "Empire of the Rising Sun," and not required to carry the Imperial flag to distant parts of the world, the decrease in the coal-carrying capacity of the "Shikishima" has enabled an additional weight of material to be worked into her construction, and thus made her in defensive, as her armament will be in offensive power, one of the most formidable armourclads constructed for any Navy.

The new battle-ship, which has been designed by Mr. George Mackrow—the veteran naval architect of the Thames Ironworks Company—and his staff, is built on the bracket frame system, with wing passages at the sides, which will be used for coal stowage. Her bottom, which is cellular, is connected with water-tight flats at both ends, practically making her a double-bottomed ship throughout. For side protection the ship has an upper and lower armour belt of Harveyized nickel steel; the lower belt, 8 feet 2 inches in depth, extending from stem to stern, is 9 inches thick throughout the length of the machinery and magazine spaces, tapering to 4 inches thick at the ends. The upper belt, for the protection of the gun battery, and which covers the sides for 250 feet in length amidships to the height of the main deck, and encloses the two barbettes, is of 6-inch armour. Within the main or lower armour belt, and rising from its lower edge to a height of 2 feet 8 inches above the water-line, is a complete armoured steel deck extending from stem to stern 2½ inches thick, an extra plate 1½ inches thick being worked on the slopes of this deck within the citadel, making a thickness of 4 inches of steel at these parts; further deck protection is also afforded by the main deck being composed of plates 1 inch thick in the way of the citadel.

At either end of the 250 feet armour belt, which forms the sides and determines the length of the citadel, and on the centre line amidship, are placed the two barbettes, which, circular in form and protected with 14-inch armour, rise from the protective deck to about 4 feet in height above the upper deck, curved athwartships steel bulkheads being worked between the decks from the barbettes to the ship's sides.

The armament of the "Shikishima" consists of four 12-inch 40-calibre breech-loading guns, two being in the forward and two in the after barbette; fourteen 6-inch 40-calibre Q.F. guns, each mounted in a casemate armoured with 6-inch Harveyized nickel steel; eight casemates being on the main deck, and six on the upper deck; all made water-tight on their inner and outer sides, thus serving to protect the gun crews from explosive shells entering between decks, and preventing water finding its way there through a damaged gun port. In addition to the above-detailed guns, there are twenty 12-pounder Q.F. guns on the upper deck, and twelve 3-pounders distributed on the upper and main decks, military tops, and on the bridges. There are also fitted five 18-inch torpedo-tubes, one forward above water and four submerged.

The propelling machinery of the "Shikishima" is being supplied by Messrs. Humphrys, Tennant, and Co., of Deptford, the same eminent firm who engined the cruiser "Yoshino," of Yalu fame, and the battle-ship "Fuji" previously mentioned. It consists of two independent sets—in separate engine-rooms—of the firm's now well-known type of three-cylinder triple-expansion engines, which will be of 14,500-I.H.P., and have cylinders 34 inches, 53 inches, and 84 inches diameter for high, intermediate, and low-pressure respectively, with a piston stroke of 4 feet, the cylinders being each carried independently by cast-iron

supporting columns at the back, and forged steel columns in front; the crank shaft-bearing brackets by which the columns are carried being of cast steel. The crank shafts, which are in three parts, and interchangeable, are of steel, 16 inches diameter, and hollow; the propeller shafting is of the same material, 15 inches diameter; and the trust blocks are fitted with horse-shoe collars lined with white metal. Each set of engines drives a three-bladed screw propeller 17 feet diameter and 18 feet pitch, with gun-metal boss and manganese bronze blades; the set of engines has one air pipe 24 inches diameter, driven independently, and one brass condenser with a tube cooling surface of 7,750 square feet. The circulating water is supplied by independently-driven centrifugal pumps, which are arranged to clear the ship of water in case of flooding.

Steam is supplied by twenty-five water-tube boilers of the latest improved Belleville type, having an aggregate heating surface of 37,936 square feet, each boiler being made up of seven or eight elements—there are two sizes—of 4½ inches diameter tubes. In each boiler uptake is fitted an economiser, or feed-water heater, made of 2¾ inches diameter tubes connected at their ends by junction boxes in the same way as the elements of which the boilers are composed, which heater delivers the feed-water to the boiler at a temperature of 260°. The boilers, which have a total grate surface of 1,141 square feet—there being but one fire-grate to each—will be worked at a pressure of 270 lbs. per square inch, which is reduced at the engines to 210 lbs.

The "Shikishima" will be steered by means of Cameron's patent self-regulating steering gear—it being the same as fitted to the "Fuji"—the steering engines for working it being in duplicate, placed in separate water-tight compartments, as now adopted in ships of the class in the British Navy. These engines will be controlled, as in the case of the "Fuji," from five different stations in the ship; the controlling of the steering gear from these stations being maintained by hydraulic telemotors. The ship has two military masts, with double tops to each; the lower for fighting purposes and the upper for search-lights and signalling. She will be lighted throughout by electricity, the installation—supplied and fitted by the Thames Ironworks Company—consisting of six search-lights, with 24 inches diameter projectors and Mangin mirrors. Four dynamos, with their driving engines, three of 400 ampères and 80 volts, and one of 200 ampères and 80 volts, supply the current, about 700 incandescent lamps being used in lighting the ship.

The "Shikishima," being intended for a flag-ship, will be manned by a crew of 741, which will include an admiral and thirty-eight officers, accommodation for the latter being provided on the main deck, the admiral's quarters being right aft, his saloon, a capacious apartment, looking out on to the stern galley or walk. Forward of this saloon are the ward and dining rooms, and on either side of the ship forward of these are the officers' cabins. In connection with these apartments it is to be noted that, wherever possible, wooden fittings have been substituted by steel or other metal, the bulkheads dividing the cabins being of corrugated sheet steel, and the panelling of steel plates japanned. The crew are berthed in the fore part of the ship, mess accommodation being provided for the whole ship's company at one sitting.

Thirteen boats will be carried by the new battle-ship, which will include two torpedo vidette-boats of the British Admiralty type, 56 feet long, fitted with Thames Ironworks water-tube boilers; these boats will carry two fish torpedoes each in dropping gear, and a 2½-pounder Hotchkiss gun in the bow. The anchor gear of the ship is of Messrs. Harfield and Co.'s manufacture, adapted to 2½-inch cables. The large anchors, four of which are carried, each weighing about 6 tons, being of Admiral Inglefield's latest improved pattern, with several smaller anchors of Admiralty pattern.

As the "Shikishima" is, as we have previously said, the heaviest vessel of her class that ever went down the ways in any shipyard, viz., 8,250 tons, and her

overall length 440 feet, the following facts in connection with her launch will, we think, be interesting :—

The ship being about 2,250 tons heavier than H.M.S. "Albion," launched from the same shipyard in June last, a massive cradle and substantial launching ways were necessary to ensure the ship's safe transport to the waters of Bow Creek, which is not more than 200 feet wide at the end of the slipway. The launching ways provided, the lower or ground, and the upper or sliding pieces, were in this case 420 feet and 330 feet long respectively ; the former being of elm and the latter of pitchpine, both being 5 feet wide and laid 25 feet apart from centre to centre. The cradle which carried the ship down to the water weighed 300 tons, so that about 8,550 tons would be the deadweight on the ground ways—or some 2½ tons pressure per square foot of their surface—which served as rails over which the ship had to be guided and transferred to the water. The declivity of the ways was ¾ inch to the foot, and the weight on the foremost poppits when the ship commenced to lift was 1,400 tons. The launch of this splendid ship was in every sense a great success, as she took the water without the slightest hitch—a feat seldom achieved with abnormally heavy ships. In addition to the anxieties attending her launch in such a narrow waterway, great expense had to be incurred in effecting it, its cost, including labour, materials, etc., approaching £8,000.—*Engineer.*

Steam Trial.—The new second-class protected cruiser "Kasagi," built at the Cramp's ship-yards, in Philadelphia, has completed her trial trip, and with rough water and a strong tide setting almost at right angles with the course, a mean average speed of 22·75 knots per hour was developed. The course was 20 miles long, in four legs, and the following table shows the results of the run up and down the course, a total of 40 miles :—

	Elapsed time. Min.	Sec.	*Speed.* Knots.
Run up.			
First lap	12	54	23·25
Second lap	13	7	22·90
Third lap	13	0	23 07
Fourth lap	13	0	23·07
Total intervals, 52 mins. 9 secs. Average 23 knots.			
Run down.			
First lap	13	14½	22·65
Second lap	13	14	22·67
Third lap	13	33	22·12
Fourth lap	13	19	22·55

Total intervals, 53 mins. 20 secs. An average of 22½ knots. Mean speed for the run, 22·75 knots.

The revolutions rose from 158 at the beginning of the run to 164 at the end. To show the perfect condition of the machinery, a series of progressive trials was run as soon as the main trial was over, in order to get the speed at 80, 125, 150, and 162 revolutions. The "Kasagi" is 374 feet long and 48 feet beam, and is one of the heaviest armed cruisers of her size afloat. She will carry two 8-inch breech-loading rifles, and ten 4·7-inch rapid-fire guns.—*Army and Navy Journal.*

UNITED STATES.—*Launch of the "Illinois."*—This first-class battle-ship was launched on the 4th ult., at Newport News. Her dimensions are as follows :—Length, 368 feet ; beam, 72 feet 3 inches ; draught, 25 feet ; with a displacement of 11,525 tons. Her engines are to develop 10,000-I.H.P., giving a speed of 16 knots. Her armament will consist of two 13-inch guns in two turrets, one forward and one aft ; fourteen 6-inch, sixteen 6-pounder, and four 1-pounder Q.F. guns. The "Illinois" has a belt of Harveyized armour of a maximum thickness of 16½ inches, which extends in the wake of the machinery spaces and is carried forward continuously up to the stem, and to within about 75 feet of the stern. It is 7½ feet in depth, 3½ feet of it at the normal draught of the vessel being above

the water-line and 4 feet below it. The forward turret for the 13-inch guns will be located above the spar deck, and four of the battery of fourteen 6-inch rapid-fire guns will also be located on this deck. The other ten guns will be located on the main deck immediately below the spar deck. Two of these will be placed forward, firing through ports on either bow. Each of these gun positions, as well as those of the four guns on the spar deck, will be protected by 6 inches of reforged Harveyized steel. On the main deck amidships and between the 13-inch turrets there will be eight 6-inch rapid-fire guns, four on each broadside.

One excellent feature of the "Illinois" is the extraordinary amount of armoured area which she presents against the shells of the enemy. Not only is there a heavy belt of armour for nearly three-quarters of her length at the water-line, but the hull is further protected above this main belt by a supplementary belt of lighter armour 5½ inches in thickness which extends from the top of the armoured belt amidships throughout the height of two decks. This armour extends from barbette to barbette and it ends in diagonal bulkheads which rest upon the 12-inch bulkhead that extends across the ship and joins the armour belt with the barbettes. Immediately inside the 5½-inch armour, and carried well forward and aft, are cofferdams 3 feet wide and 3 feet in height, the top of which is 6 feet above the mean load water-line. These cofferdams are closely packed with corn pith cellulose. It can thus be seen that the central portion of the ship is completely shut in by an unbroken wall of armour, which extends from 4 feet below the water-line to the level of the spar deck, a vertical height of about 23 feet; moreover, in no part are these walls less than 5½ inches in thickness. When we remember that 5½ inches of Harveyized steel is sufficient to burst all but the largest shells on the outside of the ship, it is evident that in the new battle-ships our gunners will have very excellent protection.

A comparison of the "Illinois" with the "Canopus" type of the British Navy shows that in some respects, though they are smaller, our ships are superior, while in others they are not so formidable. Exclusive of the horizontal deck the total weight of armour carried by the "Illinois" class is 2,000 tons, which is considerably in excess of that carried by the "Canopus." This is remarkable when we bear in mind that the displacement of the "Canopus" is about 13,000 tons, while that of the "Illinois" is 11,525 tons. If the ship which is 1,500 tons larger is less heavily armoured, the question arises, What are the compensating features? To what use is the extra displacement put? It is chiefly devoted to larger coal-carrying capacity, larger stores and ammunition supply, and more powerful engines and boilers. The larger ship, moreover, provides increased accommodation and enables a bigger crew to be carried. The increased ammunition supply of the "Canopus" over the "Illinois" is not very considerable. Her maximum coal supply is 1,850 tons as against 1,200 tons of the "Illinois." Her engine power is 13,500 as against 10,000 of the "Illinois," giving her a speed of 18¾ knots as against 16 knots, and her complement of officers and men is 700, as against 489 for the "Illinois." On the other hand, the "Illinois" possesses marked advantages in protection and the weight of her armament. Her belt varies from 9½ to 16½ inches, whereas the belt of the "Canopus" is only 6 inches in thickness with a 3-inch sloping deck behind it. The armour on the gun positions varies from 5½ to 17 inches in the "Illinois," while in the "Canopus" it ranges from 5 to 12 inches. The maximum thickness of the deck plating in the "Illinois" is 4 inches and in the "Canopus" 3 inches. The "Illinois" carries four 13-inch 60-ton guns and fourteen 6-inch 6-ton guns, against four 12-inch 46-ton guns and twelve 6-inch 7-ton guns for the "Canopus." It is evident that the weights allotted to guns are considerably heavier in the "Illinois." Unfortunately the "Illinois" will not get the benefit of the improved weapons which are to be mounted on our latest battle-ships. Her guns are of the older type, and the 13-inch 60-ton weapon has

less energy than will be possessed by our new pattern 12-inch gun. The respective speeds of the two ships are as we have said 16 knots for the "Illinois" and 18¾ knots for the "Canopus." It is here, in respect of her comparatively low speed, that any fault can be found with the design of the "Illinois;" and it is satisfactory to know that this defect will be remedied in the "Maine" and her sister-ships, which are guaranteed to make 18 knots, and will possibly run up to even 18½ or 19 knots on their trials.

In estimating the power and all-round efficiency of the new battle-ship, we cannot do better than compare her with another ship of the same class with which the public has become thoroughly familiar—the "Oregon." Measured on the basis of the displacement, the "Illinois" is about 1,237 tons larger, the normal displacement of the "Oregon" being 10,288 tons, and that of the "Illinois" 11,525 tons. A comparison by displacement of two ships built at an interval of six years (the "Oregon" was authorised in 1890, and the "Illinois" in 1896) does not, however, give an adequate idea of the superiority of the later over the earlier vessel, as the improvements in the methods and materials of war-ship construction in the interim render the later ship, weight for weight, a greatly superior fighting machine.

In a general way it may be said that mere increase in size means increase of efficiency, for the larger ship will be more stable as a gun platform, will be less effected by a head sea, and in case of an artillery duel to the death will possess a larger reserve of buoyancy, that is to say, it would take a larger number of shot holes to sink her.

Judged as a seagoing vessel, the most marked advantage of the "Illinois" over the older ship is in her increased freeboard. The main deck in the "Oregon" is about 12 feet above the water-line, but the "Illinois" is provided with a spar deck which extends above the main deck for over two-thirds of the ship's length. This raises the freeboard to 20 feet forward and amidships and 13¼ feet aft, an increase which would enable her to steam full speed and with fairly dry decks into a sea which would roll green water over the bows and forward turrets of the "Oregon." The advantage of freeboard was noticed during the Santiago blockade, when the "Oregon," or one of her type, was steaming to Guantanamo in company with the "Texas" (a high freeboard ship) against a nasty head sea. The "Texas" was dry and buoyant, while the low freeboard vessel was plunging heavily. A further advantage resulting from lofty decks is the high command of the guns. The bore of the forward 13-inch guns of the "Illinois" will be 26½ feet above the water, as against 18 feet for the "Oregon." The other guns will be carried at the following heights:—The 6-inch guns from 15 to 22½ feet, the 6-pounders from 30 to 40 feet, and the 1-pounders in the tops will be from 60 to 80 feet above the water-line. Command in a gun at sea has been likened in its advantages to "reach" in a boxer. Not only are the guns and their mounts out of the reach of the waves, but their projectiles are less likely to be deflected by striking the tops of the waves.

The protective arrangements of the "Illinois" are greatly superior. Not only does she carry armour of a greater resisting quality, but it is better disposed. The side armour of the "Oregon" only extends in the wake of the engines, boilers, and magazines, that of the "Illinois" is carried right up to the bow. The bow of the "Oregon" might be broken in by rapid-fire shells, letting water into the forward compartments and throwing the ship out of trim. This could scarcely happen to the "Illinois," whose bow at the water-line will be protected with 4 inches of Harveyized steel, sufficient to burst the shells of medium calibre on the outside of the vessel. The protective deck, moreover, will be heavier, being 2¾ inches on the flat and 3 to 4 inches on the slopes, as against a uniform thickness of 2¼ inches in the "Oregon." The heavy armour of the sides, turrets, and barbettes will be of about the same thickness as that of the "Oregon"; but as it will embody the improvements in the art of armour

manufacture which have taken place in the past six years, its resisting qualities will be considerably greater.

The same degree of improvement is noticed in the armament, for although the main battery is the same, consisting of four 13-inch guns, the improvements in turrets and turret gear, in mounts and breech mechanism, are such as to greatly increase the efficiency of these weapons in the "Illinois" When we come to the secondary or intermediate armament, we are on debated ground. In the "Oregon" this consists of eight 8-inch and four 6-inch slow-fire weapons, while in the "Illinois" it is represented by fourteen 6-inch rapid-fire guns. The twelve guns of the "Oregon" are capable of about nine shots per minute under favourable circumstances, whereas under similar conditions the fourteen guns of the "Illinois" could deliver between eighty and ninety shots in the same time The destructive and crippling effect of an 8-inch shell would be enormously greater than that of a 6-inch shell, but the chances of making a hit would be 9 to 1 in favour of the rapid-fire weapons. The results at Santiago show that rapidity of fire is of prime importance, and seem to confirm the wisdom of our naval authorities in replacing the 8-inch slow-fire by the 6-inch rapid-fire guns.

But what a pity that we do not possess an 8-inch rapid-fire gun in our Navy.

The 6-inch battery is disposed on two decks, and is protected by a complete wall of armour 5½ and 6 inches in thickness; moreover, the effect of a bursting shell is localised by walls of 1½-inch steel which extend out from the sides of the ship between each pair of guns. Other improvements will be found in the method of supplying ammunition to the guns and in the mounting and general handiness of the guns themselves.

Taken altogether, the "Illinois" is a great advance upon the earlier ships, the only point in which the "Oregon" approaches her being that of speed. The "Oregon" on her trial trip made 16·8 knots; the contract speed of the "Illinois" is 16 knots. As there is no speed premium attached to the later vessel, it is not probable that it will exceed, even if it equals, that of the Pacific coast vessel.—*Scientific American.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING OCTOBER, 1898.

General Rt. Hon. Sir Redvers H. Buller, G.C.B., V.C., etc., to command the Aldershot District; Lieut.-General Sir George S. White, G C.B., V.C., etc., to be Qr.-Mr. General to the Forces; and Colonel (hon. Major-General) H. F. Grant, C.B., to be Inspector-General of Cavalry, with the temporary rank of Major-General. Major-General H. Le G. Geary, C.B., to be Lieut.-General. Colonels E. Mockler and F. D. Mander, Bombay Infantry, H. H. P. Cowper, Bengal Cavalry, F. Lorn Campbell, h.p. Scots Guards, and A. E. Turner, C.B., R.A., to be Major-Generals; Colonel W. D. Wilson, R.A.M.C., to be Surgeon-General. Major-General Sir W. F. Butler, K.C.B., to command the troops, South Africa; Major-General W. F. Gatacre, C.B., D.S.O., *p.s.c.*, to command the troops, Eastern District; Major-General W. J. Gascoigne, to command the troops China and Hong-Kong; Lieut.-General Sir E. Markham, K.C.B., R.A., to be Governor and Commandant, R.M. College, Sandhurst; Colonel Sir A. Gaselee, K.C.B., A.D.C., Indian Staff Corps, to command a 2nd Class District in India, with the temporary rank of Brigadier-General; Colonel R. B. Lane, C B., h.p., to command the garrison of Alexandria; Mr. George Wyndham, M.P., to be Parliamentary Under-Secretary of State for War; Colonels D. T. Kinder, h.p., to command the 33rd Regimental District; T. E. Verner, h.p., to command the 10th Regimental District; W. B. Williams, h.p., to command the 62nd Regimental District; and F. Ryley, h.p., to command the 48th Regimental District; Major-General Sir H. H. Kitchener, K.C.B., etc., Sirdar of the Egyptian Army, created Baron Kitchener of Khartoum and Aspall, Suffolk.

HOME.—A Royal Warrant, dated October 20th, of which the undermentioned is a copy, has been issued as a special Army Order. It is the outcome of the scheme foreshadowed in the memorandum of the Secretary of State for War, relating to the Army Estimates, 1898-99. It is intended to facilitate the preparation of a force for special service out of the United Kingdom, when required, from battalions at home, without mobilising the ordinary Reserve, by enabling infantry soldiers on leaving the colours to undertake voluntarily the liability to recall during their first year of Reserve service. It will be seen that the men who assume the liability will receive extra Reserve pay of 6d. a day, making with the ordinary Reserve pay 1s. a day. The number of these special Reservists is limited to 5,000.

"VICTORIA R.I.

"WHEREAS WE have deemed it expedient to form a new section of Our 1st Class Army Reserve;

"OUR WILL AND PLEASURE is that, with reference to the provisions of the Reserve Forces and Militia Act, 1898, a new section of our 1st Class Army Reserve, to be styled Section A, shall be formed from November 1st, 1898, and that the Regulations of Our 1st Class Army Reserve shall be amended in accordance with the following rules:—

"1. Section A will be composed of Reservists of the Royal Artillery, Foot Guards, Infantry of the Line, Army Service Corps, and Royal Army Medical Corps, whose character on transfer to the Army Reserve was not lower than 'Good,' and who may engage, during the first six months of their Reserve service, to join that section. Non-commissioned officers will be accepted within such limits as may hereafter be decided. Married men may be accepted, and men may be permitted to marry during their service in Section A.

"2. The total strength of Section A will not exceed 5,000 men. There will be no restriction as regards the number of men belonging to particular regiments, but preference will be given to men belonging to regiments whose home units are named for service abroad.

"3. Men joining Section A will be enrolled therein on the date of their transfer to the Reserve, or at any subsequent period within six months from the date of their transfer to the Reserve.

"4. The conditions of service will be as follows: (*a*) A Reservist joining Section A will be liable to be called out on Army service, under Section 1 of the Reserve Forces and Militia Act, 1898, during the first twelve months of his service in the Army Reserve. (*b*) During his period of service in Section A a Reservist will not be liable to be called out on Army service unless he is required for service outside the United Kingdom when war-like operations are in preparation or in progress, or unless any portion of the Reserve is on permanent service under the provisions of Section 12 of the Reserve Forces Act (1882). (*c*) If called out for Army service, he will not be liable to serve for more than twelve months with the colours from the date of rejoining, unless any portion of the Reserve is on permanent service under the provisions of Section 12 of the Reserve Forces Act (1882), in which case the men of Section A will be liable to continue in Army service, subject to Section 14 (1) of the Reserve Forces Act (1882). (*d*) The engagement to join Section A may be revoked by the Reservist on giving three months' notice in writing to his Commanding Officer, provided he is not required for Army service during such three months. On receiving a formal release from his engagement in Section A, he will revert to the section of the Reserve to which he belongs under the terms of his Army attestations. (*e*) On completing his term of engagement in Section A, a Reservist will, in like manner, revert to the section of the Reserve to which he would otherwise belong.

"5. Before joining Section A each man will be examined by a military medical officer, and only those who are certified as medically fit for service at home and abroad will be accepted.

"6. On joining, each man will be required to sign, in duplicate, a declaration

on the certified form, before an officer qualified to attest under Section 18 of the Reserve Forces Act (1882). These declarations will be preserved with the man's original and duplicate attestations.

"7. The rate of pay will be 1s. a day, which will be paid monthly in arrear by means of Army money orders, and be in lieu of the ordinary Army Reserve pay and deferred pay.

"8. Men of Section B or C of the Army Reserve, on being enrolled in Section A, will be settled with at once for any balance of ordinary or deferred pay due to them.

"9. Life certificates will only be required to be rendered quarterly, under the rules applicable to the other sections of the 1st Class Army Reserve. A new form of Identity Certificate (Army Form D 468) will be used.

"10. Forfeiture of pay and service will also be governed by the general regulations of the 1st Class Army Reserve.

"11. The numbers joining Section A will be reported to the War Office in the Army Reserve Monthly Return (Army Form D 440).

"Given at Our Court at Balmoral, the 8th day of October, 1898, in the sixty-second year of Our Reign.

"By Her Majesty's Command,

"LANSDOWNE."

In reference to a paper by Major A. C. Yate, on North-West Frontier Warfare, which appeared in the October JOURNAL, p. 1171, Major F. N. Maude, *p.s.c.* (late R.E.), writes, that in the many recent discussions to which our many recent expeditions on the Frontier have given rise, two very important points seem to have been overlooked, and, as a consequence, conclusions have been drawn very unfavourable to both officers and men when compared with their forefathers in the old "Brown Bess" era.

The fighting range of the old smooth bores was between 100 and 200 yards, and a man's hand had to be very unsteady before the nervous quiver due to excitement, etc., took the axis of the piece off the object. Nowadays, the range is anything up to 2,000 yards, and the slightest tremor at the moment the spring is released suffices to send the bullet wide of the mark. It can in fact be shown mathematically that the chance of missing a given target under service conditions varies as some function of the square of the range, *i.e.*, as $R^2 \tan \theta$, where θ represents the angular deviation of the axis of the barrel from the true direction at the moment the bullet leaves the muzzle.

But: The vulnerable area of, say, 10,000 men, with pack transport, etc., is constant, that is to say, the enemy has always the same large target to snipe at.

Now: Draw a circle, say 1 inch in diameter, and shade it to represent the camp, picket, or other spot to be defended, and then with the same centre strike circles of 2 inches and 20 inches respectively, and within these areas dot in 2,000 or 3,000 Afridis as targets for fire, and calculate the probability of our divergent fire hitting any particular dot. It will be seen at once how enormously reduced are our chances of effecting casualties as compared with those of our enemy.

This applies equally to anything in the shape of a closed body, whether camp, baggage animals on the march, etc., down to four men carrying a wounded comrade.

Again: When in the old days your fire had shaken a body of Afghans at, say, 100 yards range, 30 seconds start was the most they could count upon; now, at 1,000 yards, 10 minutes at least have to be made up before the kookrie or bayonet can hope for blood.

Bearing these points in mind, it will at once become evident that if, in a broad generalisation of the facts and figures relating to Frontier warfare, more men nowadays are actually required than in the past to deal with a given number of tribesmen, this in no way detracts from the merit of our present men and officers, but is a necessary consequence of the improved arms we have to encounter.

The following is an account of a useful scheme carried out, during its recent training, by the 3rd Bn. The Queen's (Royal West Surrey Regiment), commanded by Lieut.-Colonel F. H. Fairtlough, which might well be taken as an example by other Militia battalions wishing to make the most of the limited period of an annual training. It consisted of a four days' route march and tactical exercise in the neighbourhood of Guildford, Godalming, and Albury.

The force, consisting of the headquarters and wing of the battalion, and numbering 431 of all ranks, left Guildford at 2 p.m. on the 6th July, arrived at Broadwater at 4 p.m., where tents were pitched. Distance 5½ miles.

On the 7th July the detachment, parading at 8.30 a.m., arrived at Milford Common in 1¼ hours, distance 4½ miles; and after practising the attack, steadily, twice, returned to Broadwater Camp at 2.45 p.m., covering the distance in 1 hour and 5 minutes.

On the 8th July the camp was struck and all baggage packed and loaded at 7.30 a.m. At 9.30 the detachment proceeded *viâ* Farcombe, Shalford Common, Bramley, and Wonersh, Wonersh Common (where the attack was again practised), to Albury, arriving at 1.15 p.m.; distance 6 miles. There the camp was pitched.

On the 9th July, after striking camp and sending back the baggage to Guildford, the detachment paraded at 2.30 for manœuvres according to a scheme framed by the officer commanding the 2nd Regimental District, and representing an advance guard engaging the outposts of a force represented by the 2nd V.B. of the Queen's. Thirty rounds of blank ammunition per man were issued. The "Cease-fire" was sounded at 5.30, and the detachment arrived at Guildford Camp at 7.20 p.m.

The order of dress was "marching order," but without valises. The number of horses used by the transport was 16, and wagons 91, including 5 for camp equipage, officers and men; officers' mess 1; sergeants' mess 1; and grocery bar 2, all of which were furnished by the battalion. The number of tents carried was 44, including 9 for officers, 30 for the men, 1 for sergeants' mess, 1 for guard room, and 3 for canteen, grocery bar, and stores. The officers were allowed 30 lbs. weight each for baggage, sergeants 15 lbs., and men 5 lbs. The band performed each night for the benefit of the public. There was a total absense of crime and sickness, and no man fell out at any stage of the march. The men appreciated the scheme as a variety from the ordinary routine of an annual training, while all ranks benefited by it in many ways.

The Lee straight-pull rifle, to which attention has lately been attracted, is of ·303 calibre, so that it can easily be compared with the regulation weapon of the British infantry. The rifle can be manufactured and sold at a profit for £3 (a fact which may be worth remembering in the future), whereas the British Government has never paid less than £4 for the Lee-Metford. In weight it is 2 lbs. 2 ozs. less than the Lee-Metford, which is a great consideration. The bolt pulls straight back, and the bolt action seems to work more easily and smoothly than in the case of the Lee-Metford. Particularly noticeable is the absence of the slight check which is nearly always preceptible as the cartridge is being pushed home into the Lee-Metford or Lee-Enfield chamber. A straight pull back, a cartridge dropped into the opening, a straight thrust home, and the operation of loading is complete. In simplicity the new rifle compares favourably with the Lee-Metford, since its constituent parts are fewer in number by about half those of that weapon, and its firing system can be taken to pieces and put together again without difficulty with the bare hands. The refilling of the magazine, the weak part of the Lee-Metford, is effected in the straight pull from above by means of the Parkhurst and Lee cartridge-clip holding the five cartridges together at the base, which detaches itself and is ejected in the act of loading. Finally, there is an ingenious and forcible ejector and a serviceable cut off. The rifle has been supplied to the United States Navy, the pattern chosen being of ·236 calibre, having a muzzle velocity of 2,460 feet per second when fired with a steel

jacketed bullet under the impulsion of smokeless powder. Its penetration at a range of 15 feet is such that it will pass through 62 pine boards, each $\frac{7}{8}$ inch thick. The gun and system will withstand a pressure exceeding 60,000 lbs. to the square inch. While lighter than the Lee-Metford, it has only 28 parts as compared with 57 in the latter. In the hands of an expert over 50 shots per minute can be fired from the straight-pull, with the use of the clip. The rifle is manufactured by the Lee-Metford Small Arms and Ammunition Company, Birmingham.

The following are the full terms of the settlement decided on by the Government of India for the future control of the Khyber Pass :—"1. The Afridis, having ruptured their agreement and forfeited their allowances, have forced the Government to take and hold the Pass, which the Government will control as it thinks desirable. 2. The Pass shall be open to trade. A fort will be built at Lundi Kotal, with other forts between that place and Jamrud. A railway will be built if necessary. Offences committed in the vicinity will be punished. 3. The Afridis shall deal only with the British Government. They will manage the affairs of their own country, but in the Khyber they will be responsible to the Government, and shall co-operate in the preservation of order and security and the protection of life. 4. The Government will continue the allowance and will maintain a Militia recruited from the Afridis and other clans, which will be commanded by British officers. It will arrange for supports if troops are not always stationed at Lundi Kotal. It will make all arrangements regarding trade through the Khyber, which the Militia will guard. 5. The allowances will be commenced on the dates the tribes adhere to the terms imposed, and will cease simultaneously with any misconduct on the part of the tribes in the Pass or against British allies." The statement that the new Viceroy will decide as to the future political control of the Pass is incorrect.

For the expedition which is about to start from Freetown, Sierra Leone, against Bai Bureh, there will be available a sufficient number of officers who have experience of the country, Major Tarbet, Inspector-General of the Sierra Leone Frontier Police, having a staff of twelve British officers, all of whom—with the exception of Lieutenant C. E. Birch, of the Royal Berkshire Regiment—belong, like himself, to the Militia. Major Tarbet is a Captain and Hon. Major in the 3rd Bn. South Lancashire Regiment. Beyond the police, there are at Sierra Leone and Gambia a large contingent of the West India Regiment and Native companies of artillery and engineers.

"Duncan" Gold Medal Prize Essay, 1899.—The subject approved for the "Duncan" Gold Medal Prize Essay, 1899, is as follows :—

"The technical training of officers in Garrison Artillery."

The Rules for the Prize Essays now read :—

The annual Gold Medal, when awarded, to be accompanied by an *honorarium* of £20; the Silver Medal by an *honorarium* of £10.

The candidates must be officers of the regiment who are members of the R.A. Institution.

Officers are requested to confine their essays to about 16 printed pages of the "Proceedings"; other things being equal, brevity will count towards success.

The essays must be forwarded to the secretary so as to reach him on or before the 1st of April.

Each essay must be *type-written* in triplicate. The essays must be strictly anonymous, but each to have a motto, and be accompanied by a sealed envelope with the motto written outside and the name of the writer inside; further, if the writer wishes to recover from the Committee part of the cost of type-writing his essay, he should state this fact in the same sealed envelope and write outside it, above the motto, "to be opened."

All the envelopes thus marked will be opened by the secretary after the result of the competition has been announced, and he will send the writers the money for their type-writing expenses.

The Committee will allow a sum of £1 for type-writing each essay.

The essays will be submitted for decision to three judges chosen by the Committee.

The judges are empowered to recommend :—

1. That two medals, one gold and one silver, be awarded, or
2. That only one medal, gold or silver, according to the merit of the essay, be awarded, or
3. That no medal be awarded.

The names of the successful candidates will be announced at the annual meeting, and medallists will be distinguished as such in all lists, etc., issued from the Institution, and, in the event of a University man gaining a medal, a report of his success will be made to the University of which he may be a member.

The successful essays will be printed and circulated to members by the Institution.

N.B.—The Committee draw particular attention to the paragraph in the Rules above on the subject of length of essays ; it is not difficult to discover the number of words in an average page of "Proceedings" matter, and so to keep an essay within the 16 pages limit.

At a practice camp last year in the Madras command, an experiment was carried out to show the comparative effectiveness of shrapnel shell and long-range infantry fire. At a distance of 2,700 yards, and at a target 80 feet by 20 feet, S Battery, Royal Horse Artillery, fired nine shrapnel in seven minutes, and scored 150 hits. One hundred men of the Cheshire Regiment then fired 2,400 rounds of Lee-Metford ammunition, sighting from 2,300 yards to 2,700 yards, and scored 129 hits. This long-range fire of the Cheshire must be considered very good, and shows the power of the Lee-Metford even at 2,700 yards.

AUSTRALIA.—The Cabinet of Sydney has approved of a proposal, discussed at the Conference of Premiers held at Melbourne, to send 150 men of the New South Wales Permanent Artillery to England, a similar body of Imperial Artillery being brought to Sydney, for a period of two years.

CANADA.—The inspection of infantry battalions in the cities has been carried out this year as in the past. That is, the inspection has been a purely ceremonial affair, although the General Order reads as follows :—"Inspecting officers are reminded that a review and march past or other ceremonial movements, do not constitute an inspection, nor are they even a necessary part of it. The object of an inspection is to ascertain and record the state of organisation, and the value of the work done in each corps."

The usual procedure at an inspection is as follows :—

A battalion is drawn up on parade in review order, receives the inspecting officer with a general salute, who rides down and up the lines, after which a march past takes place ; the manual and firing exercises under the senior major and a few show-battalion movements under the junior major. The battalion is then again taken over by the Commissioned Officer and drawn up to form three sides of a square, when the inspecting officer addresses them. The usual address is one of extreme flattery ; the corps is patted on the back as being, if not the best, one of the best in Canada ; the last inspection is always the best and an improvement on the preceding one. No faults are pointed out in uniform, equipment or movements, with the result that every battalion considers itself as near perfection as it is possible to attain.

The battalion has been trained in these show ceremonial movements for the inspection, but there is not the slightest attempt made to do any practical work ;

to manœuvre in the field under service conditions; to do the attack or to serve out and fire blank ammunition. No outpost duty is practised, and, as far as any knowledge goes as to taking up a position or fire control, it is an unexplored world to all. The drill-book gives the aim of infantry drill and training, to obtain, at the decisive moment, the greatest development of infantry fire under the most careful supervision and control. This is not practised at all; it is not called for by the inspecting officers. The captains of companies and section leaders have no opportunity given them to practise fire control, which is of such vital importance in infantry training.

So long as the General Officer Commanding ignores the General Orders and treats them with contempt, by having ceremonial inspections himself, other inspecting officers can hardly be called to account for following suit.

The establishment of the permanent infantry schools is fixed in the Establishment List for 1898-99, at 24 officers and 305 non-commissioned officers and men. Out of this number there are 3 officers and 140 non-commissioned officers and men in the Yukon contingent, leaving but 165 non-commissioned officers and men to be divided among the four schools at London, Toronto, St. Johns, and Fredericton. To command these 165, it takes 22 officers (including the Commandant at Toronto), or on an average one officer to every seven and a half men. Each infantry school has not less than five officers whose daily pay amounts to some $18.25, and 15 staff-sergeants and sergeants with daily pay of $11.35, or a total of $29.60 per day for pay to command 26 rank and file, whose pay amounts to $11.80 per day. In the Army, a captain and two subalterns command a company of 112 men. It cannot be pretended that the permanent infantry is being overloaded with officers for the purpose of imparting instruction to the "attached," for it is common knowledge that most of the seven officers appointed within the last six months are incapable of imparting instruction, never having received it themselves. The regulations in regard to any qualification, either of a military or literary nature, were suspended, to enable these appointments to be made. The permanent force is apparently to be a "house of refuge" for any person with a good strong "pull," and the increase of the establishment from 20 to 24 officers means that the amount of their pay will come out of the total Militia vote, and a proportionate number of the Militia will be deprived of their training, to enable these officers to "feed at the public crib," at the expense of the Militia. On the formation of this corps, one captain and two subalterns were sufficient for 100 men at each school; now it takes a major and four subalterns for 26 rank and file. The Militia list contains the names of 245 graduates of the military college—none of whom were appointed. Out of the 24 permanent infantry officers, one only is a graduate of the military college, and he was appointed three years ago.—*Canadian Military Gazette.*

AUSTRIA-HUNGARY.—*A New Motor Wagon.*—Some experiments took place last month in the hilly country near Galitza with a new military auto-mobile baggage wagon on the Daimler system. The wagon is similar to the ordinary field one, strongly built, with movable sides. A comparatively speaking small motor is placed in front of the driver's seat, and is connected by shafting with the hind wheels. The motor is a Daimler 10-H.P. benzine engine, the reservoir being constructed to contain a supply for 12 hours' working. In front of the motor is the drum-shaped cold-water apparatus, which holds sufficient water to last a day. The weight of the wagon is 2,900 kilogrammes (about 1,450 lbs.), and it was required to draw a load of 5,000 kilogrammes (about 2,500 lbs.) up an ascent with a gradient of 12-100, which it successfully did. The wagon has both a hand and foot brake, both being required to bring it to a stop on a steep road. One man is sufficient to work and drive the wagon, the necessary levers and brakes being convenient to his hands, and everything works easily. The engine consumes at full speed about 3¾ kilogrammes of benzine and about 20 grammes of lubricating

oil per hour. Further trials on roads with steeper gradients are to be carried out. The military authorities appear satisfied that they can transport easily a complete mountain battery (guns, carriages, and ammunition) up important heights, when the guns would be placed in position by the gunners. Although beasts of burden will not be completely done away with, it seems likely that, as far as mountain batteries are concerned, their number will be considerably reduced.

A Long-distance Swim.—A remarkable long-distance swim, from Vienna to Pressburg, was successfully carried out last August by Rittmeister E. Baron von Forgatsch and a Herr H. Angeli. The distance is 61 kilometres (about 32 miles) and was covered by the swimmers in a little under seven hours, without taking any nourishment; their clothes were carried in waterproof bags on their shoulders.—*Militär-Zeitung.*

Fortress Artillery.—At the commencement of the new year eighteen captains of Fortress Artillery will be mounted, that is to say, they will receive forage for a horse. This measure, which has been expected for some time, has been rendered necessary by the formation of mobile groups of siege batteries, the commanders and officers of which ought to be mounted. In 1900, a further eighteen captains will receive the forage allowance, and there will then be left only fifty-four dismounted captains, some of whom may, under exceptional circumstances, in certain batteries, be also mounted in the future.

Remount Depôt.—It has been decided to form a new Remount Depôt at Jhaszi-Marczaltö. The establishment will consist of a major of cavalry, an accountant officer of the rank of lieutenant, a veterinary surgeon, 2 quartermasters, 4 corporals, a veterinary serjeant, a blacksmith, 30 soldiers, 2 orderlies, and 400 horses.

Medal of Honour.—The new Medal of Honour, instituted by the Emperor on the 18th August last, for military functionaries who are not entitled to receive the military medal, will be conferred on those on the active list who will have completed fourteen continuous years' service on the date of the 2nd December next, and in the future on those who complete the same period of service. The decoration will be worn attached to a ribbon similar to that of the military medal and after the war medals.

New Magazine Rifle.—The magazine rifle (model 1895) having been finally approved by the Emperor, has been definitely adopted as the Army rifle, and a general order on the subject will shortly be issued Its calibre is 8 millimetres, the same as the 1888 model, but it weighs only 3·3 kilogrammes (6·9 lbs.) instead of the 4·4 kilogrammes (8·8 lbs.) of the other weapon. Each soldier will carry 26 clips and 130 cartridges in place of 22 and 110. The stock is prolonged to the muzzle and the bayonet is shorter and lighter. Seventy-five of the new rifles were first manufactured at the Styrian and Hungarian factories respectively, and at the last-named an improvement in the spring of the bolt was suggested and accepted by the military technical commission. These 150 rifles were then experimented with in three of the army corps with such satisfactory results that the pattern was immediately adopted.—*Revue du Cercle Militaire.*

DENMARK.—*Mobilising Strength of the Army.*—The late Minister of War, Lieut.-General Bahnson, has published a summary of the number of men, who according to the last Army Regulations of 1894, would be available in case of war. There are every year under training:—

Infantry—*a.* Guards	272	men.
,, *b.* Line	5,300	,,
Cavalry	480	,,
Field Artillery	648	,,
Fortress ,, ...	820	,,
Technical Branches	157	,,
Engineers	270	,,
	7,947	,,

According to the Regulations the men remain on the roster for service for 16 years, but the writer assumes that on mobilisation no men who had been longer on the lists than 14 years would be called up, as during the last two years many men would from various causes have been freed from military duties. If only men up to 14 years' service were called out, there ought to be 111,258 of all arms available; but certain deductions would have to be made from this number, through deaths, unfitness for service from various causes, etc., and in all probability as many as 25 per cent. would have to be struck off, leaving about 83,000 men, as follows:—

Infantry	58,500 men.
Cavalry	5,000 ,,
Field Artillery	6,800 ,,
Fortress ,, ...	8,600 ,,
Technical Branches	1,650 ,,
Engineers	2,800 ,,
Total	83,350 ,,

To complete the cadres of the Army are requisite:—

a. Infantry:	31 battalions of 1,000 men	31,000 men.
	Depôts, etc.	4,000 ,,
	13 reinforcing battalions of 1,000 men	13,000 ,,
	Depôts, etc.	4,000 ,,
b. Cavalry:	5 regiments of 600 men, including Depôts	3,000 ,,
c. Artillery:	12 Field-batteries of 200 men, including Depôts	2,400 ,,
	Fortress Artillery	10,000 ,,
d. Engineers	... ...	2,800 ,,
Total	... ...	70,200 ,,

From the above reckoning it would appear, that making allowance for all deductions, the mobilisation of the reserves up to 14 years' service, gives an ample supply of men, so that the force at Copenhagen could be increased to four battalions, and the strength of the Zealand reinforcing battalions be raised from four to six companies.

The only difficulty in mobilisation arises from the nature of the country, which makes the concentration of forces at certain points where they may be required, somewhat difficult.—*Militär-Wochenblatt.*

FRANCE.—*Cavalry Accountant Officers.*—On account of the increasing difficulty of obtaining accountant officers in the cavalry, the Minister of War has issued the following order, dating from the 2nd October:—

Every year, at the time of the General Inspection, the technical inspector will submit the names of some lieutenants for employment as captain for pay duties, and for that of captain in charge of clothing. The recommendations will be made in favour of officers who appear to have a special aptitude for these employments, and who will engage to remain attached to the Accountant Department for eight years from the date of their promotion. The candidates will have to pass the requisite examination, the result of which will determine their seniority on the roster, which will be drawn up by a special commission appointed for this purpose. The successful candidates will receive appointments according to seniority, the number being fixed each year by the Minister. These new regulations will not come into effect until next year.

Augmentation of the Foot Artillery.—By the latest Act settling the constitution of the cadres and effectives of the Active and Territorial Armies, it was decreed that there should be 18 instead of 16 battalions of foot artillery. The

formation, however, of the additional 17th and 18th Battalions has been delayed, waiting for the development of the recruiting sources and the allocation of the necessary special credits. The *Journal Officiel* of 15th ult. contains the nomination of a certain number of officers to form part of the staff of the 17th Battalion, which will be stationed at Toulon, and the constitution of which has been decided by an Order of 25th September last. By this same Order a new battery is also added to the 15th Battalion. Up to the present the 13th Battalion at Nice has detached three of its batteries for duty at Toulon.

The 16 battalions at present on the strength are :—The 7th Battalion, 5 batteries strong, at Langres ; the 1st Battalion, at Lille, the 2nd at Maubeuge, the 3rd at Reims, the 4th and 5th at Verdun, the 8th at Épinal, the 9th at Belfort, the 10th at Besançon, the 12th at Briançon, the 13th at Nice, the 14th at Bayonné, the 15th at Saint-Servan, all six batteries strong ; the 11th Battalion at Lyons, 8 batteries ; the 6th Battalion at Toul and the 16th at Rueil, 9 batteries. A total of 103 batteries.

This organisation is now modified as follows :—The 14th Battalion will have four batteries ; the 2nd, 7th, 13th, and 17th Battalions will have five batteries ; the 1st, 3rd, 4th, 5th, 8th, 9th, 10th, and 12th Battalions, 6 batteries ; the 11th and 15th Battalions, 7 batteries ; the 6th and 16th Battalions, 9 batteries. A total of 104 batteries.

The Act, referred to above, provided 108 foot batteries, so that it still remains to raise four batteries for the new 18th Battalion.

Improvised Cavalry Swimming Belt. — Captain Frœlicher, of the 12th Dragoons, has lately been making some interesting experiments, by which small detachments or patrols of three or four men, who have neither the time nor the means of constructing rafts or bridges, and who have to act secretly, can cross a river.

The apparatus devised by Captain Frœlicher can be constructed in a few minutes, and as it cannot capsize it gives confidence and an assurance of safety to horsemen, transforming into a simple operation what is often the delicate one of swimming a horse, owing to the ease with which the animal turns over in the water. Captain Frœlicher has devised two apparatuses, the buoy and the buoy-boat (*canot-bouée*). Their stability is due to their centre of gravity being below the surface instead of above. The buoy consists of two sacks half-filled with straw, hay, leaves, or grass, and joined end to end in such a way as to make a circular buoy in which the horsemen ensconces himself close up to his arm-pits. Thus prepared, he allows his horse to tow him, holding on to his mane, his chest remaining out of the water. In order to avoid the inconvenience of taking off clothes and saddles, Captain Frœlicher has invented his buoy-boat. Two full sacks form the bow and stern, two poles or lances form the sides, four stirrup-leathers secure the ends of the poles or lances to the sacks, and the girth forms a seat. The two poles ought only to be separated by the width of the hips, and the girth ought to be sufficiently loose, so that the man when seated has the poles at the height of, and against, his hips. The boat can be steered by an improvised oar. The horseman takes off his boots and trousers, places his weapons on the after stirrup-leathers, his saddle, etc., in front, seats himself on the girth, and is towed by his horse. If so few cavalry-men know how to swim, it is because regiments have not the proper means for imparting instruction, and we hope that this will now be remedied.—*Revue du Cercle Militaire.*

Age of French Generals.—According to the *Annuaire de l'Armée Française,* out of the 110 Generals of Division on the Active Lists, two Generals, Saussier and d'Exéa-Doumere, are over 70 years of age, and they will be retained on the Active List during their lives, as they have commanded armies in the field. The remainder on the list are between 55 and 65 years old, the average age being 62 years, 64 being under 63. Only two have

risen from the ranks, 28 having been educated at the Polytechnic, and 83 at the Military School of St. Cyr. Fifty-eight formerly belonged to the infantry, 20 to the cavalry, 22 to the artillery, and 10 to the engineers. General Billot was advanced to his present rank as long ago as 1870, while 84 have only been promoted during the last five years.

Out of the 220 Generals of Brigade, 62 reach the age of retirement (62 years) during the present year. The youngest on the list is 48 years old, while the average age is 58 years and 3 months. Fifty-seven were educated at the Polytechnic, 154 at the Military School of St. Cyr, 6 rose from the ranks, and 1 joined from the Italian Army after the annexation of Savoy and Nice. One hundred and three formerly belonged to the infantry, 47 to the cavalry, 39 to the artillery, 23 to the engineers, and 6 to the gendarmery. The senior on the list obtained his step in 1889, the larger number of the remainder have been promoted during the last three years.

To the Reserve belong 96 Generals of Division and 150 Generals of Brigade; of the former the oldest is 87, the youngest 65; of the latter the oldest is 84 and the youngest 60; the average age of the former is 74, and of the latter 66 years and 3 months.—*Militär-Wochenblatt.*

GERMANY.—*The Kriegs-Akademie at Berlin.*—The Academy of War at Berlin re-opened on the 3rd ult., and 411 officers, drawn from all the army corps except the two Bavarian corps, are pursuing a course of instruction. Bavaria possesses its own academy at Munich.

Out of the 411 officers, there are four (one infantry, two cavalry, and one field artillery) who have been allowed to go through the first year's course without having passed the requisite examination for admission. The 411 officers are divided as follows:—138 for the first year's course, 137 for the second year, and 136 for the third year. The railway regiments, for whom a superior technical school is provided, where their officers complete their instruction, have this year sent no officers to the academy at Berlin.

Field Howitzers —It is announced that some field howitzer batteries are to be formed, and it is stated that the 13th Battalion of foot artillery is to be transformed next April into a group of field-howitzer batteries (*Schwere Feldhaubitz-Abteilung*), which will be stationed at Fort Mutzig, near Molsheim, in Alsace.

Mounted Orderlies.—A new detachment of mounted orderlies (*Jäger zu Pferde*) is to be organised without delay in the 12th Army Corps (Saxon) The army corps which possess at present a squadron of mounted orderlies are the following:—the Guards Corps, 1st, 14th, 15th, 17th German Corps, and the 2nd Bavarian Corps. The two new squadrons will raise the number already formed from six to seven.

The Instruction Battalion at Potsdam.—This battalion was reconstituted at the end of September as in previous years. All the German army corps are represented, with the exception of the two Bavarian corps. This battalion was formed rather more than fifteen years ago in order to ensure uniformity of instruction in details all through the Army, and the results have proved to be excellent. Formerly it was reconstituted only in the spring, generally about the middle of April, and was broken up in September after the grand manœuvres, being represented during the winter simply by a company-cadre. The officers and men selected for the battalion remained a year and a half. But after the introduction of the two years' service this system had to be modified, and the battalion is now broken up after the autumn manœuvres and reformed on the 30th September. From that time to the beginning of April it is thus composed:—A major in command, a lieutenant as adjutant, 4 captains, 4 first lieutenants, 12 second lieutenants, 2 doctors, 1 paymaster, 65 non-commissioned officers, 24 drummers and buglers, 640 lance-corporals (*Gefreiten*) and soldiers, 25 orderlies, with 8 tailors and shoemakers. From the month of April to

its breaking up the battalion is increased, the additional numbers being fixed ach year.

The battalion-commander, the adjutant, doctors, paymaster, sergeant-majors, sergeants, the drum-major, tailors, and shoe-makers remain longer with the battalion and, with the exception of the doctor and paymaster, are detached from the Guard Corps. A quarter of the officers are detached for two years and the remainder with the non-commissioned officers and privates for a year and a half. The captains and lieutenants are only appointed if they are unmarried; further, captains can only be appointed so long as they are not on the roster for promotion during their 18 months' course; while lieutenants must have at least three years' service in their regiment. It goes without saying that only officers, non-commissioned officers, and men of irreproachable character are selected to join this battalion.

The battalion-commander can nominate 24 non-commissioned officers to remain a second year. Soldiers, who are allowed to rejoin, can remain until they are promoted to non-commissioned officers. The men receive from their respective corps a complete field kit, everything having to be good and to fit well. Pay, lodging allowance, subsistence money, etc., are paid by the battalion of instruction, but both officers and men receive a small monthly allowance from their regiment. It is evident that as the battalion at Potsdam is composed of the *élite* of the German infantry, the work of the instructors should be easy and pleasant. The battalion, which is attached to the Guard Corps, is at present commanded by Major Haslingen.

The Riding School at Hanover. — The School for Equitation at Hanover, which is divided into two sections, one for officers and one for non-commissioned officers, received on the 1st October, at which date the course of instruction commences, 66 first and second lieutenants of cavalry and field artillery, of which 16 belong to the first-named branch, and 62 non-commissioned officers of cavalry. The course lasts a year. A fourth of the officers and non-commissioned officers, who are specially recommended, are allowed to remain a second year.—*Revue du Cercle Militaire.*

ITALY.—*Long-distance Ride.*—An interesting long-distance ride took place last month from Florence, through Pescia, Lucca, and Pisa, back to Florence by Fortezza di Basso.

The distance was about 310 kilometres (roughly 170 miles), and 18 officers started from the Piazza di Veccaria at 10 a.m., on the 10th ult. There were four prizes of 2,000, 1,000, 600, and 400 lire (1 lira=10d.); only 9 of the competitors completed the whole distance, the four winners being all lieutenants. The times were as follows:—No. 1—31 hours 15 minutes; No. 2—31 hours 45 minutes; No. 3—31 hours 55 minutes; No. 4—33 hours 53 minutes. On the following morning, six out of the nine who had arrived started for the final ride, a distance of 30 kilometres, and the four victors of the previous day again came in in the same order.

The horses of the winners 1 and 2 were of English race, but born in Italy, that of No. 3 came from the Marennes, that of No. 4 was a pure-blooded Italian. During the ride, two of the English horses succumbed to fatigue, and two more after their arrival, so there was much jubilation over the success of the Italian horses, which had alone survived the trial.—*Die Vedette.*

Alessandria.—This fortress which, since Italy became united as one kingdom, has lost much of its importance, is probably shortly to be partially dismantled. The industrial development of the town has much increased, and a Council, which sat under the presidency of the Crown Prince, having decided that there is no necessity for Alessandria to be maintained as a first-class fortress, has recommended that the walls of the enceinte be pulled down. The outlying forts,

however, will remain, so the town will assume now more the character of a large entrenched camp.—*Militär-Zeitung.*

Remounts.—As the result of the experience gained during the last ten years, the Minister of War, himself an old cavalry officer, has directed that each cavalry regiment is to receive yearly 96 young horses from the remount depôts. The cavalry school at Pinerolo receives every year 80 remounts from the depôts. With this quota the regiments and cavalry school must cover all losses during the year, and all horses over 16 years old struck off the strength.

Army Changes.—The headquarters of the 4th Army Corps are to be transferred for reasons connected with mobilisation from Piacenza to Genoa.

The Minister of War has directed the railway battalion stationed in Turin (which consists of 6 companies, and is for all duties connected with technical railway work) to be placed under the orders of the Chief of the General Staff. For other service, the battalion, which was formerly independent, is, like the other engineer sections, placed under the supervision of the Inspector of Engineers.—*Deutsche Heeres-Zeitung.*

Bicycle Trials.—Some new trials have taken place at the Central School of Musketry at Parma with a Bersaglieri Cyclist Company, composed of 1 captain, 4 lieutenants, 1 doctor, and 45 men, divided into two sections, of which one was provided with the regulation bicycle of the engineers, and the other with the folding bicycle. Three other captains of Bersaglieri also accompanied them in order to study the method of organisation and employment. During the course, which lasted from the 15th September to the 15th October, the chief business was to note, in the different tactical exercises carried out, both by the company alone and in combination with the three arms, the staying power of the cyclists and their machines in the wet weather and over the broken roads, as well as of the different methods of equipment recently proposed. Excellent results are said to have been obtained in spite of the deluge of rain which fell during the greater part of the time; on the other hand, opponents of cyclist system maintain that cyclists cannot be counted upon when the roads are bad or muddy.

Chargers for Horse and Field Artillery Subalterns.—By an Order of the 8th September last, the Minister of War has directed that in regiments of field and horse artillery two horses, to be chosen from amongst the best horses of the remounts, are to be placed at the service of the lieutenants and sub-lieutenants in each of the batteries of the regiment. On principle, every lieutenant and sub-lieutenant of the corps indicated ought to have compulsorily at his disposal one of these horses, "*Chevaux de charge*," and to ride it on service or under circumstances determined by the commander of the corps, who should, however, always be able, on his own responsibility, to authorise an officer to substitute for this service charger a saddle-horse of his own.

The Minister of War reserves the right of allowing a service charger to captains for a limited time on the recommendation of the commander of the corps.

An officer provided with a service charger can keep it at his own stables at his own expense, but forage is supplied and shoeing done at the expense of the regiment.

The service chargers are not branded on the thigh, as are the other troop horses, nor are the rules as to size, trimming of the tail, etc., applicable to them, and they are to be considered supernumerary to the horse establishment of the battery, when they are in use by an officer.

The commanders of corps can authorise an exchange of service chargers among officers, or their return if they prove unfit for their duties, but officers will be held pecuniarily responsible for any damage the animal may sustain through carelessness.—*Revue du Cercle Militaire.*

RUSSIA.—*The Trans-Caspian Railway.*—This railway is very shortly to be placed under the orders of the Ministry of Roads and Communications. A new railway battalion has been organised for the Andijane-Tashkent line; and the whole system of the Russian Central Asian railways will be placed under the direction of the Governor-General of Turkestan. The headquarters of the administration will be fixed in all probability at Tashkent, and provisionally during completion either at Samarkand or Askabad. The new organisation will come into force on the 1st January next.

New Range-finder.—The Headquarter Staff has issued a circular on the subject of the double range-finder, invented by Commandant Souchier. Experiments with this instrument have been carried out by different corps in the military districts of St. Petersburg, Warsaw, and Kief, as well as at the School of Musketry for Officers, and excellent results have been attained with it, both as regards accuracy in the measurement of distances, facility of manipulation, and its resistance to wear and tear. The small-arms section of the Artillery Committee, to whom the examination of the results of the trials of this and other range-finders has been submitted, has arrived at the conclusion that the Souchier range-finder is the most perfect, and expresses a wish that it should be issued to the troops. In consequence of this report, the Headquarter Staff, by the direction of the Minister of War, has issued the circular in question, and a complete description of the apparatus has been given, with a notification that guaranteed copies of it can be obtained from the Officers' School of Musketry at a cost of forty roubles each.

New Cadet Corps.—Up to the present in the military districts of Warsaw and Odessa, where large bodies of troops are quartered, there has been no cadet corps, with the result that parents of candidates in these districts have been obliged to send their sons a long way from their homes. To obviate this inconvenience, a corps of cadets is to be organised in each of these two towns, and it is hoped that the two establishments will be open next year. This measure increases the cadet corps from 22 to 24.—*Revue du Cercle Militaire.*

Aluminium Horse-shoe.—Some experiments have lately been carried out in the Russian Army with a horse-shoe made of aluminium. The new shoe has been issued provisionally to a Finnish dragoon regiment, and in order to test it thoroughly under equal conditions with the old-fashioned iron ones every horse is shod with two of each. Up to the present the results have been very favourable for the aluminium shoe, as they are much lighter than the iron ones, do not wear out so quickly, and are not so easily affected by damp and mud.—*Militär-Zeitung.*

The "Okhotniki."—If any parallel is to be found to this institution it is in our own Indian Army in the "Guides." But even there the name has lost its original significance, and the parallel is incomplete in other ways. The word, which literally corresponds to "Chasseurs," may be paraphrased "Trained Scouts."

As far back as the defence of Sebastopol such detachments were employed and continued to be used during the campaigns in the Caucasus, Central Asia, and the war with Turkey. At first they were organised by the officers in immediate command, and were not a recognised institution. It was more like the old plan of calling for picked men as volunteers on a forlorn hope or any other piece of special work. This state of things lasted till the war in the Caucasus plainly demonstrated their great utility, and then the system entered on a new phase. Small permanent bodies of them were formed in various parts of the Empire in immediate touch with the regiments from which they were drawn. No orders were issued for the purpose from headquarters, but they were so useful that the local commanders took upon themselves the initiative. But at last, in 1886, an Army Order was issued providing for their creation, but only to the extent of four men per company, and assigning no special time for them to be trained in their peculiar duties, except in a general way on any days when they

might not be on ordinary duty. This naturally made the men eye the duties with disfavour, as they lost all their spare time by joining them, and their efforts were made to appear of only secondary importance. A circular of 1891, however, set apart two days in the week for their training, and directed that they should as far as possible be excused sentry duty, should be allowed better rations when on field practice, and a cart to carry their baggage, and a saddle-horse to their commander. A year later they were given a green badge on the sleeve, whilst men were to be specially promoted to sergeant for proficiency in scouting without going through the training-school, and their commander to have table-money on the same scale as the junior officers. Soon after the complement of the detachments was raised to eight men per company. These concessions greatly tended to raise the estimate of their duties formed by their comrades. At one time they were quartered separately, but are now according to companies.

The general orders lay down the objects for which the detachments exist, and in outline also the methods of attaining them. Beyond this, all is left to the divisional commander. But the actual execution and instruction is left to the commander of the detachment, under the supervision of the regimental commander, who has to report every year on the detachment and its work.

The commander of such a detachment has two tasks set before him, the bringing the physical condition of his men to the highest perfection, and also the cultivation of their intelligence and moral qualities. The former receives every encouragement from superiors and is easily tested, and if he follows the regulations he can hardly fail to achieve satisfactory results. The results of the other are less patent, and it is consequently apt to be neglected, though in reality it is by far the more important of the two. The former includes gymnastics, fencing, shooting, and field training. Activity is, of course, an essential in men selected for such work, and there are very complete regulations as to their gymnastic training, some of the exercises being carried out in full field equipment. The men are also trained in games, swimming, and the surmounting of obstacles in cross-country work. Fencing is naturally a good exercise both for hand and eye, but at present too little attention is paid to actual service conditions. As regards shooting, they are exercised at movable targets, and also in firing at game wherever practicable, but this, of course, can only be done when they get into sparsely-populated districts. The best possible moving target is naturally an animal, or a bird on the wing. Cross-country expeditions are made with the object of inuring the men to long marches, acquainting them with the lie and conditions of the roads, accustoming them to service conditions, and giving them a knowledge of the country and its inhabitants. It has been found that the men are more up to their duties when kept permanently apart from their companies.

The men are encouraged to read and discuss their duties, to gain a knowledge of tactics (from the Regulations), and of tactics and sport, while lectures are also delivered to them. In outpost and scouting and patrolling duties it is sought to make them so far perfect that they may be fit to replace under-officers in charge of a post or detachment, and be self-reliant under any conditions that may arise. Reconnaissances are practised up to great distances and under as varied conditions as possible. When the immediate neighbourhood of the garrison towns is exhausted, as an object-lesson the men are taken still further afield whenever practicable. They act as scouts to bodies of troops during manœuvres, this being of course the final test of efficiency, as being most nearly akin to actual service conditions, the only drawback being the absence of an enemy to outwit. They are made to draw up detailed accounts of the positions reconnoitred and the country surveyed, and it is carefully pointed out to them *what* they are to observe and *why*. As far as possible such instruction is given orally, and they are catechised as to the information obtained. Things are simplified for them as much as possible, the intelligence of the Russian soldier not being superabundant. Great care is also taken to teach them to use and to make maps, and

to find their way by map and compass, and by the stars. They have also to give verbal descriptions of the ground surveyed, and point out from memory its salient features. Shooting in the sporting sense is found an admirable means of cultivating their skill as marksmen, as well as endurance and activity. In such a country as Russia there is of course plenty of opportunity for such training.

A few words may be said in conclusion about the commanders of these detachments. Their usefulness and zeal would be greatly increased if a more liberal allowance were made to them in consideration of the greater expenses incurred. Some table-money, twenty-three roubles a month, and a horse have indeed been granted them. But the wear and tear of uniform and shoe-leather is very great on surveying expeditions, and a married man, especially, is obliged practically to keep two tables—one at his permanent place of garrison, and another where he is at the time. The horse should also be permanently assigned to him and forage allowed, as it is essential that he should be able to move rapidly. As it is, he generally gets a troop-horse from the transport, a very poor mount. He should also have an officer's Cossack saddle, one of the most comfortable known. It will thus be seen that the "Okhotniki" are the eyes, ears, and feelers of an army, discharging duties hitherto supposed to be entirely the *rôle* of cavalry. The nearest parallel to be found to them are the scouts familiar to our boyhood in the graphic pages of Fenimore Cooper.—*Voïénnyi Sbórnik.*

SWITZERLAND.—*Army Estimates.*—In the Military Budget for 1899, the War Department has estimated for the purchase of a part of the material necessary for the equipment of a balloon company. It is proposed to provide: a balloon, a windlass for the cable on wheels, a hydrogen generator, a balloon gasometer, a steam boiler with compression pump and the necessary tubing, with transport wagons. In the following year it is proposed to complete the equipment. A demand is further made for two 12-centimetre nickel-steel guns, two 53-millimetre Q.F. guns, and two reserve 12-centimetre howitzers for the St. Gothard; four 12-centimetre nickel-steel guns for Saint-Maurice, etc. Steps are also being taken to provide everything necessary to enable the troops of the first ban of the Landwehr to take the field, if they are called on to do so, the necessary expenses being distributed over four years.—*Revue Militaire Suisse.*

NAVAL AND MILITARY CALENDAR.

OCTOBER, 1898.

3rd (M.) 1st Bn. Northumberland Fusiliers left Alexandria for Crete in the "Jelunga."

4th (Tu.) Launch from San Rocca Yard, Trieste, of first-class cruiser "Kaiser Karl VI." for Austrian Navy.

,, ,, Launch at Newport News, U.S.A., of first-class battle-ship "Illinois" for U.S. Navy.

6th (Th.) 1st Bn. Northumberland Fusiliers arrived at Candia, Crete, in the "Jelunga."

,, ,, 37th (Howitzer) Field Battery, R.A., and 1st Bn. Grenadier Guards, arrived in England from Egypt, in the "Dilwara."

11th (Tu.) United States flag hoisted at Manzanillo, Cuba.

13th (Th.) Port Guard-ship Squadron dispersed. H.M. Sloop "Melita" paid off at Malta.

14th (F.) H.M. Sloop "Melita" re-commissioned at Malta.

15th (Sat.) 18th Hussars left Bombay for Natal in the "Simla."

19th (W.) 1st Bn. Gordon Highlanders arrived at Alexandria from India, in the "Nubia."

20th (Th.) Launch of H.M.S. "Prometheus" from Earle's Shipbuilding Yard, Hull.
25th (Tu.) Publication of colonial despatch from Captain E. C. D. Fairtlough, D.S.O., 4th Bn. Royal Dublin Fusiliers, respecting disturbances in Sierra Leone.
27th (Th.) Sirdar arrived in England.
" " Major Marchand left Fashoda for Cairo.
" " D Battery, R.H.A., left England for India, and 56th Field Battery, R.A., left England for Egypt in the "Dilwara."
" " Launch of first-class cruiser "Spartiate" at Pembroke.
" " Launch of second-class cruiser "Hyacinth" from Clyde Shipbuilding Company at Govan-on-Clyde.
29th (Sat.) Presentation of colours to 2nd Bn. Cameron Highlanders at Balmoral, by H.M. the Queen.
" " H.M.S. "Partridge" arrived at Plymouth, from West Indies.

Addenda to September Calendar.

21st (W.) Launch of torpedo-cruiser "Nadiejda" from the Société des Chantiers de la Gironde for the Bulgarian Government.
28th (W.) Launch of second-class cruiser "Gelderland" from the Feyenoord Yard, Rotterdam, for the Netherland Navy.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: July and August, 1898.—"The Battle of Cavite." "Shells of large capacity and the Armour of Cruisers." "An Imaginary Race between Ships-of-war." "Help for the Victims of Naval War." "The Oscillation of Ships in a Sea-way." "The 'Maine' Explosion."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 11. Pola and Vienna: November, 1898.—"Navigation at Sea and Navigation Laws." "A New Instrument for Taking Bearings at Night." "On Refraction Observations." "The Naval and Military Importance of Photogrammatry." "Improvements in Torpedoes." "The Spanish-American War, with special regard to the Naval Operations" (*concluded*). "The Latest Trials of the English Cruiser 'Diadem.'" "The Submarine-boat 'Holland.'" "Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: September, 1898.—"Strength of Maritime Nations." "A Practical Guide to the South Coast of Brazil." "Plastomenite" (*continued*). "Our Navy." "Foreign Navies." "Naval Notes."

FRANCE.—*Revue Maritime.* Paris: August, 1898.—"The Organisation of Foreign Dockyards." "The Oceanography of France" (*continued*). "Trials of the German Battle-ship 'Ægir.'" "The Question of Naval Boilers." "Water-tube Boilers." "The Development of the Japanese Fleet." "Naval Notes." "The Maritime Fisheries."

September, 1898.—"The Geometry of Diagrams" (*continued*). "Regularisation of the Speed of Auxiliary Engines of War-ships." "Multiple Screws placed on a single Shaft." "The Uniformity of Ships-of-war." "A Contribution to Nautical Astronomy." "Naval Notes." "The Maritime Fisheries."

Le Yacht. Paris: 1st October, 1898.—"The Mediterranean Squadron: Gun and Speed." "Yachting Notes." "The New Chilian Cruiser 'O'Higgins.'" 8th October.—"Solidarity of Armament and Naval Construction." "Yachting Notes." "The Bulgarian Aviso 'Nadiejda.'" "Conditions of Habitability on board Modern Ships." 15th October.—"The Bergen Exhibition." "Yachting Notes." "Conditions of Habitability on board Modern Ships" (*continued*). "The Merchant Marines: French and Foreign." "*À Propos* of the Battle of Cavite." "The Question of Tonnage for Yachts" (*continued*). 22nd October.—"The System of Subsidies and the Rehabilitation of our Merchant Navy." "Yachting Notes." "The Visit of the Minister of Marine to Corsica." 29th October.—"The *Points d'Appui* of the Fleet." "Yachting Notes." "The 'Fram' and the Navigable Loire." "Visit of the Minister of Marine to Tunis and Algeria." "The Question of Tonnage for Yachts." "The Merchant Navy: French and Foreign."

Le Moniteur de la Flotte. Paris: 1st October, 1898.—"Naval Hospital Ships." "The International Fishery Congress at Dieppe." "Marine Disasters in 1895." "Colonial Notes." 8th October.—"The Navy League." "Visit of the Minister of Marine to Corsica, Algeria, and Tunis." "The *Points d'Appui* of the Fleet." "The Fisheries and Ostriculture." 15th October.—"The *Points d'Appui* of the Fleet." "Visit of the Minister of Marine to Corsica, Algeria, and Tunis" (*continued*). "Colonial Notes." 22nd October.—"Porto Vecchio." "Visit of the Minister of Marine to Corsica, Algeria, and Tunis" (*continued*). "Colonial Notes." 29th October.—"The Defence of Corsica." "Visit of the Minister of Marine to Corsica, Algeria, and Tunis" (*continued*). "Colonial Notes."

La Marine Française. Paris: 15th October, 1898.—"The Target Practice of the Mediterranean Squadron." "A Programme of Naval Reforms" (*continued*). "Opinions of French Admirals on our Squadrons and Naval Divisions." "The Officers for Electric Duties." "France in the Indian Ocean." "Proposed Regulations for avoiding Collisions in Fogs." "Naval Notes."

GERMANY.—*Marine Rundschau.* Berlin: November, 1898.—"The Durability of the most common Copper-Alloys in Sea-water." "On the Means for Condensing Sea-water" (*continued*). "Nordelbish-Danish." "The Origin of Napoleon's Expedition to the East in 1798." "The latest in Gunnery Matters." "On the Reciprocal Action of Electro-Magnetic Resonators." "Hurricanes in the West Indies." "Sketches from the Spanish-American War." "Naval Notes."

ITALY.—*Rivista Marittima.* Rome: October, 1898.—"The Ethics of Command." "On the Method of Calculating Latitude by means of Circum-Meridian Altitudes." "Flying Kites." "Some Remarks on the War in Cuba." "The Spanish-American Conflict." Letters to the Director:—"Something more about Cables." "Studies on some Special Movements of the Sea when near the Land." "Naval Notes."

PORTUGAL.—*Revista Portugueza, Colonial e Maritima.* Lisbon: October, 1898.—"Gomez de Azurara." "Colonial Agriculture." "Geography and the Portuguese Tongue." "International Law: with particular regard to the Sea and Maritime War." "The Bays of South Angola." "Naval Notes."

SPAIN.—*Revista General de Marina.* Madrid: October, 1898.—"Injuries to Engines of Ships at Sea and the Method of Repairing them" (*continued*). "Geographical-Medical-Social Study of the Island of Balabac" (*continued*). "International Congress of Naval Engineers and Constructors" (*continued*). "Arsenals and Dockyards." "Some Notes on the Manufacture of Tubes." "Maritime Spain." "The Maritime Fisheries of Spain in the Future." "The Right of Search in time of peace." "The Arrival at Santander and Madrid of the Personnel of Cervera's Squadron." "Naval Notes."

MILITARY.

AUSTRIA-HUNGARY. — *Militär-Zeitung.* Vienna: 4th October, 1898.—"The Kaiser's Birthday." "The Pay Question." "The Dreyfus Case and the French Army." 12th October.—"Some more about Special Promotions." "The Dreyfus Case." "To the Friends of Peace." 20th October.—"Sunday Rest." "The Picquart Affair." "The Dum-Dum Bullet." 28th October.—"Zde!" "The United States Losses at Sea during the last War." "Gun-barrels from Steel Wire."

Organ der Militär-wissenschaftlichen Vereine. Vienna: September, 1898.—Has not yet been received.

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: October, 1898.—"A Glance at Gun Trials, etc., during the years 1896 and 1897." 'A Glance at Experiments in the Pioneer Department during 1896 and 1897." "Remarks on Matters affecting Machinery, etc." "Preparation of Fortresses for War." "New Mountain Guns." "Blowing up of the Chimney of an Annular Kiln."

FRANCE.—*Revue du Cercle Militaire.* Paris: 1st October, 1898.—"The Military Week." "Fourth Work on the Map." "The Manœuvres between the 8th and 13th Army Corps in 1898: Operations of the Cyclist Company." "Two Brave Soldiers of the 51st Demi-Brigade of the Line." "Special Exercises of the Medical Service of the Military Department of Paris." 8th October.—"The Military Week." "In Holland: The Royal Review at Renkum." "The Manœuvres between the 8th and 13th Army Corps in 1898: Operations of the Cyclist Company" (*concluded*). "The Importance of the Instruction of Troops in Peace-time." 15th October.—"The Military Week." "Explosions apparently Spontaneous." "The Importance of the Instruction of Troops in Peace-time" (*continued*). "The Militarising of the Personnel of the Railways, Post, and Telegraphs in Italy." 22nd October.—"The Military Week." "On the Initiative of Subordinates." "The Opinion of Admiral Makaroff on Battleships." "The Importance of the Instruction of Troops in Peace-time" (*continued.*) 29th October.—"The Military Week." "Armies and Navies at the International Exhibition in 1900." "The Imperial German Manœuvres of 1898." "On the Initiative of Subordinates" (*concluded*). "The Importance of the Instruction of Troops in Peace-time."

Revue de Cavalerie. Paris: October, 1898.—"En Avant." "Spain." "A Comparative Examination of the Regulations for Cavalry Manœuvres in the Principal European Armies" (*concluded*). "From Bautzen to Pläswitz in May, 1813" (*continued*). "Pure Blood in Hunters and Military Horses." "The Election to Military Grades under the Old Monarchy; Cavalry Quartermasters."

Journal des Sciences Militaires. Paris: October, 1898.—"The Field-Firing and Practical Exercises of the Châlons Camp" (*continued*). "The Ground, the Men, and the Weapons in War" (*continued*). "English Bullets." "The Next War." "The Methods of Instruction in Firing in France." "Life in High Altitudes." "A Scouting Detachment at the Austrian Manœuvres."

Revue Militaire de l'Étranger. Paris: October, 1898.—"The German Head-Quarters' Staff in 1870." "The Rides of the Head-Quarters' Staff in Austria-Hungary." "The School of Musketry for Infantry Officers in Russia." "The Reprovisioning of Russian Armies in the Field" (*continued*).

Revue du Service de l'Intendance Militarie. Paris: September-October, 1898.—"Impermeability of Soldiers' Clothing." "A Study of some Fossil Coal in the Department of Constantine." "Composition and Alimentary Value of Native Beans." "The Evils of Cider." "Extracts from the Works of Parmentier." "Note on the Recent Re-organisation of the Italian Army." "Value of the Wheat Harvest in France and the World." "The Prairies in Wet and Dry Springs."

Revue du Génie Militaire. Paris: October, 1898.—"Projected Railway from Tamatave to Antannanarivo." "Military Geography and New Geographical Methods." "Analysis and Extracts from Vauban's Correspondence."

Le Spectateur Militaire. Paris: 1st October, 1898.—"Decorations: Cross and Medals." "The Spanish-American War" (*continued*). "Meteorology applied to Ballooning." "On the use of Railways in the next War." 15th October.—"Decorations: Cross and Medals" (*continued*). "The Spanish-American War" (*continued*). "The Alpine Troops." "Meteorology applied to Ballooning." "Captain La Tour d'Auvergne, First Grenadier of the Republic" (*continued*).

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NOTICES OF BOOKS.

Stonewall Jackson and the American Civil War. By Lieut.-Colonel G. F. R. HENDERSON. In 2 vols. Longmans, Green and Co.: London, New York, and Bombay. 1898.

The heroic soldier, whose history has at last found worthy record at the hands of Colonel Henderson, left many legacies to his fellow countrymen, but none more valuable than the stirring words with which his story ends; and so fully do those words indicate the spirit which animated him that they may fitly serve him as an introduction as well as a farewell. "What is life," wrote Stonewall Jackson, "without honour? Degradation is worse than death. We must think of the living and of those who are to come after us, and see that, by God's blessing, we transmit to them the freedom we have ourselves inherited." None but a great man, and a man of the Anglo-Saxon race, could have written these words, and for two good reasons Englishmen should read them with pride and with attention—with pride, because he who wrote them spoke with our tongue and came of our breed; and with attention, because the words of Stonewall Jackson bear the peculiar authority of those who have sealed their faith with their blood. It is for this cause that, of all our national heroes, the words and

the memory of Nelson are most dear to his countrymen; and what Nelson is to England, that Stonewall Jackson may in some measure be to our kinsmen across the sea.

In certain particulars Stonewall Jackson differed from the type of soldier whom Englishmen generally believe to have thrust themselves to the front in that great conflict of the Northern and Southern States, which we call the American Civil War. It is customary with us to speak of the opposing armies as purely extemporised organisations, and to believe that little beyond animal courage and the fortune of survival sufficed to raise soldiers from their ranks to the highest commands. A perusal of Colonel Henderson's book will, however, show that this was by no means the case. A surprisingly large proportion of the commanding officers on both sides were professional soldiers, or had at least received a military training, and many of them had previously gained the invaluable experience that is conferred by war alone. Of this number was Stonewall Jackson.

Thomas Jonathan Jackson was born in a village in the backwoods of Virginia in the year 1824. His father, a clever and popular lawyer, had inherited and dissipated a considerable fortune, and at the age of seven young Jackson found himself without parents or means of support. His childhood appears, however, not to have been unhappy, an uncle, who gave him a home, having treated him with kindness and confidence. The order of life in the western farm of his uncle was not, it seems, to young Jackson's taste, and at a very early age he determined to raise himself to the higher rank formerly occupied by his family. When no more than seventeen years old, Jackson became a constable of his native county, a position corresponding to that of sub-sheriff. He had to execute the decrees of the justices, to serve their warrants, to collect small debts, and to summon witnesses. It was a curious office for a mere boy, and Jackson found his duties uncongenial; but, despite his youth, he faced his responsibilities with a determination which men of maturer years might have envied. After two years of this drudgery Jackson obtained a nomination to the Military Academy at West Point, where his astonishing industry and perseverance enabled him to overcome all the disadvantages of his want of education, and to earn for himself the respect of his companions. Colonel Henderson's account of the career of the uncouth backwoodsman at West Point is extremely interesting, and the comparison of the Jackson of this period with Napoleon the student is not strained.

On June 30th, 1846, Jackson became a brevet second lieutenant of artillery, and was confirmed in the rank on the 3rd March following. He was fortunate enough to be immediately employed in the Mexican war and to distinguish himself sufficiently at the capture of Vera Cruz, in the same month, to be promoted to the rank of lieutenant. The capture of Vera Cruz was an operation of no great severity, the American loss amounting to no more than 64 killed and wounded, but Jackson was soon to experience sterner work. In the battle of Cerro Gordo a Mexican field battery was captured by the gallant Captain Magruder, who was given command of it. Jackson promptly applied to be posted to the battery as one of its two subalterns, and his application was sanctioned. His promptitude and ambition won their due reward. The severe double action of Contreras and Churubusco speedily followed, and in the former fight Jackson highly distinguished himself. Finally, at the decisive battle of Chapultepec the services of the young lieutenant were most brilliant. The three guns which formed his section of Magruder's battery were compelled by the nature of the surrounding country to advance along a causeway under a heavy fire. The American losses were terrible and finally Jackson's men became demoralised and left their posts. The example of their lieutenant, walking up and down on the shot-swept road, and exclaiming calmly "There is no danger: see! I am not hit," failed to inspire them with confidence. Magruder now appeared on the scene, and being a man of like mind with his subaltern, was no

more willing than the latter to retire from the apparently untenable position. The men rallied, the Mexican artillery was gradually overcome, and the tide of victory turned.

Such was the conduct of Stonewall Jackson in his first campaign. We have dwelt more on these Mexican experiences of his than their intrinsic importance may seem to merit, because they serve so clearly to show the character of the man. In Mexico, Jackson showed the honourable ambition, the prompt grasp of an opportunity, the dauntless courage, the inflexible determination that marked him throughout his career. His rewards for his first campaign were phenomenal. Within eighteen months of his first joining his regiment Jackson was breveted major. Nor was this rapid promotion his only reward. "It is something too," says his biographer "if a man learns his own worth in situations of doubt and danger; and if he finds, as did Jackson, that battle sharpens his faculties, and makes his self-control more perfect, his judgment clearer and more prompt, the gain in self-confidence will be of the utmost value." Jackson's start in life had indeed been most fortunate. He had gone to Mexico a shy, unformed youth, holding the lowest commissioned rank. He had returned a field officer, with the highest reputation for personal courage and for the power of leading men. And, as his biographer adds, "in that distant country he had won more than fame. He had gone out with a vague notion of ruling his life in accordance with moral precepts and philosophic maxims; but he was to be guided henceforward by loftier principles than even devotion to duty and regard for honour, and from the path he had marked out for himself in Mexico he never deviated."

Two years after the conclusion of the Mexican campaign, Jackson was appointed Professor of Artillery Tactics and Natural Philosophy at the Virginia Military Institute, an establishment founded on the model of West Point, and attended by several hundred youths from Virginia and other Southern States. Here he passed ten years in the quiet performance of his duties, during the whole of which period he incessantly studied the art of war. To use his own words:—"He believed that a man who had turned, with a good military reputation, to pursuits of a semi-civilian character, and had vigorously prosecuted his mental improvement, would have more chance of success in war than those who had remained in the tread-mill of the garrison."

Thus did the shy, awkward, countrified cadet of West Point, the unformed subaltern of the Mexican campaign, steadfastly fit himself for the great future which he must have, however dimly, foreshadowed for himself—thus in this peaceful environment was forged that thunderbolt of war, that vast controlling force, to be known to men for all time as Stonewall Jackson.

At length the time came for testing the value of this steadfast preparation. At the end of the year 1860, the probability, long foreseen, of a conflict between the free and slave-holding States, that is between the North and South, became a certainty. South Carolina, Mississippi, Alabama, Florida, Georgia, Louisiana, and Texas formally seceded from the Union, and proclaimed a new Republic, with Jefferson Davis as President, under the title of the Confederate States of America. The prejudice against the institution of slavery is so strong in this country that it will strike many people as strange that men of such unquestionable nobility of character as Lee and Jackson, should have taken up arms in its defence. The attitude of the Southern States is clearly explained by the author, and the sequence of events which resulted in the additional secession from the Union of Virginia, Arkansas, Tennessee, and North Carolina is most lucidly detailed. Whether the disruption of the Union will be held by the unbiassed reader to be justified by the arguments adduced, is open to question; but that Colonel Henderson is so thoroughly in sympathy with his hero as to feel compelled to admit the justice of the cause which he espoused, seems evident enough. It is indeed a strong argument that the Southern States deemed their quarrel just that they very deliberately appealed to the arbitrament of war, well knowing how vast were the odds against them.

As soon as it became apparent that the North was bent upon the re-conquest of the South, Jackson offered his sword to his native State. Devotion to Virginia was his sole motive; he shrank from the horrors of civil strife, and the thought that his beloved home would be deluged with the blood of her own children stifled all the promptings of professional ambition. It is eminently characteristic of the man that he proposed to the minister of his church that all Christian people should be called upon to unite in a prayer for peace. War was, however, inevitable, the storm was about to burst, and so high stood Jackson's reputation that he was selected for the command at Harper's Ferry, the point where the first shot was anticipated. Nothing could have been more unpromising than his first introduction to his men. Jackson superseded the officers of the State Militia who, prior to the declaration of war had exercised command at Harper's Ferry, as at other posts. To these gaudy if enthusiastic amateurs the quiet, ill-dressed professor was in appearance a sorry substitute: Major Jackson rode a horse as quiet as himself; his seat in the saddle was ungraceful; his well-worn cadet cap was always tilted over his eyes; he was sparing of speech; his voice was very quiet, and he seldom smiled. He made no orations, he held no reviews, and his orders were remarkable for their brevity. He confided his plans to no one, and not a single item of information, useful or otherwise, escaped his lips.

How this quiet, reserved, almost insignificant man was able in a very short time to impress his personality on his superiors, his equals, and his inferiors alike, in such manner that all felt implicit confidence in his genius for war, and doubted not that, whether successful or unsuccessful, Jackson's action under any given circumstances had been and would be the best possible, is the enthralling story told by Colonel Henderson. No extracts, however lengthy, would convey the explanation.

Having been relieved of the charge of Harper's Ferry by a senior officer, Jackson received command of a brigade of Virginian infantry, forming part of the army of the Shenandoah. To this brigade, which consisted of five battalions, was attached a battery of artillery, commanded by a clergyman, and manned chiefly by theological students. This battery speedily became very efficient, and its four guns were at once christened Matthew, Mark, Luke, and John.

Jackson's brigade was composed of men of all ages and of all ranks in life; but no better material for soldiers ever existed. They were a mountain people, nurtured in a wholesome climate, and hardened by the free life of the field and forest. Nor is the purity of their motive to be questioned. They were no slave-owners fighting in defence of their property, but patriots genuine and undoubted.

The services of the first brigade immediately became conspicuous. In the first battle, that of Bull Run, their loss was heavier than that of any other brigade of the Southern Army, and Jackson himself was wounded; but victory demoralised the triumphant Southerners almost as much as the conquered Northerners, and Jackson set himself to work to establish a genuine discipline in his command. How completely he succeeded is shown by the history of the "Stonewall Brigade" during the remainder of the war.

Before following General Jackson, as he had now become, in this brief sketch of his career, we must now draw attention to the feature of the author's book, which lends it its highest value.

The lessons to be learned from the life of a great commander and a saint upon earth, as Jackson was, are of inestimable importance, but this history of Stonewall Jackson is also the history of a great portion of the American Civil War, and the lessons conveyed in its pages are of even more definite import to us as a nation. For this reason Colonel Henderson, speaking with the authority of an assiduous and accomplished student and exponent of the great operations and lessons of war, loses no opportunity of impressing on his readers the true bearing and value of the incidents which he describes. There are, to our knowledge, few more valuable lectures-in-brief than some of the notes contained in this biography, and among them we would specially commend to notice that entitled

"The cost of an inadequate Army," and the invaluable remarks "on the evils of civilian control": they are indeed written to the address of the English people, which is so slow to learn this lesson. As Colonel Henderson well says, the Cabinet of 1815 had done its best to lose the battle of Waterloo, yet the Cabinet of 1854 was allowed to work its will on the Army of the Crimea. He might have added that the civilian control of 1898 is even more complete than that of 1815 and 1854, and our people love to have it so. It should be most instructive to us to note the result of civilian control on the course of the American Civil War.

In March, 1862, more than 200,000 Federals were prepared to invade Virginia: less than 60,000 Confederate soldiers were available to oppose them. In mettle and discipline the troops were fairly matched, and the higher commands on both sides were held by regular officers who had received the same training. If the Southern infantry were the better marksmen, those of the North were better armed. The Federal Artillery was decidedly superior in every respect. "*Why was it then that McClellan failed?*"—*Answer*: "*Through Civilian Control.*" "None," writes Colonel Henderson, "were more anxious than Lincoln and Stanton to capture Richmond, to disperse the rebels, and to restore the Union. They had made stupendous efforts to organise a sufficient army. To equip that army as no army had ever been equipped before they had spared neither expense nor labour." How like England! The description might apply to any of our warlike undertakings, afloat or ashore. Nor was McClellan's failure caused by any defect in his plan of campaign. On the contrary, his design was admirable; it brought the naval power of the North into combination with the military, and it secured a convenient and rapid line of supply. Lincoln and Stanton had only one mistake to make, and they made it. They checked and controlled the operations of their Generals.

It is, as the author well says, a significant fact that for three years the control of the armies of the North remained in the hands of the Cabinet, and that throughout that period the balance of success lay with the Confederates. But in March, 1864, Grant was appointed Commander-in-Chief; Lincoln abdicated his military functions in his favour, and the Secretary of War had nothing more to do than to comply with his requisitions. Then for the first time, the enormous armies of the Union were manœuvred in harmonious combination, and success was attained.

Irrespective then of its great interest as a biography of one of the greatest soldiers, and one of the best men who ever adorned and beautified this earth with his presence, the life of Stonewall Jackson deserves most careful study by soldier and civilian alike for the sake of the admirable lessons it conveys. For Jackson himself, the book must be read by all who would understand what it is to be great in war without a taint of cruelty or baseness of any kind. The story of a noble life is most admirably and delightfully told, and the reader is irresistibly carried on from battle to battle, until the fatal day of Chancellorsville.

The great movements on either side are so clearly detailed and explained that, as it has been said that every boy who reads "Vanity Fair" for the first time believes himself a man of the world, so the young soldier who studies Colonel Henderson's pages is tempted to believe himself a strategist. Yet the great lesson of the book is that success in war comes not by chance, not by numbers alone, not by blind undisciplined courage; but by a combination of favourable circumstances, by long training of the soldier, by the genius, fostered by long and earnest study, of the commander.

There are few more touching incidents in the noble annals of war than those connected with the death of Stonewall Jackson. Those who can read unmoved of the devotion of his Staff, of his own steadfast endurance, of the last letter from Lee, and of Jackson's reply to it, are not to be envied. There is no straining after effect in the description of Jackson's death, yet the final words may live in literature.—"Once more he was silent; but a little while after he said very quietly and clearly, 'Let us cross over the river, and rest under the shade of the trees,' and the soul of the great captain passed into the peace of God."

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